AQUASERV

Research services
for **sustainable aquaculture, fisheries** and **blue economy**

Transnational Access Handbook

A guide for applicants and users of AQUASERV's TA programme

Version 1.1
14 January 2025

AQUASERV

Transnational Access Handbook

Version 1.1

About the TA Handbook

This handbook is divided into two main sections: (1) A general section about the TA programme, the application process, and reporting and post-access procedures, and (2) a list of all service-providing facilities. The appendix provides overview tables of the services provided at each facility and a glossary.

Please note: This is a living document that is subject to frequent updates. Please make sure you are using the latest available version, available at this link: https://www.aquaserv-ri.eu/ta-handbook

For any questions about the content of this handbook, please reach out to the AQUASERV Access Officer at stella.alexandroff@embrc.eu.

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AQUASERV

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AQUASERV

Section 1

Overview and Guidance

Section 1 – Overview and Guidance

1.1 Introduction

Our vision

A European Research Area-embedded instrument to further scientific advance and promote, contribute, and facilitate the implementation of the European Common Fisheries Policy, the Farm to Fork Strategy, the Sustainable Blue Economy, the European Green Deal and the EU Mission "Restore our Ocean and Waters by 2030".

Our mission

To offer unique, relevant, and centralised cutting-edge integrated and customised services to enable integrated actions and scientific advancements connecting society-farm-food-economic activity and bringing down the barriers and challenges in implementing European policies.

AQUASERV will achieve these objectives by offering scientists from academia and the private sector remote and on-site transnational (TA) and virtual (VA) access to an advanced set of European research infrastructures and its nodes related to research and management of marine and freshwater biological resources, food, and biotechnology.

AQUASERV is a joint venture of six cutting-edge research infrastructures:

- European Marine Biological Resource Centre-ERIC (EMBRC)
- Analysis and Experimentation on Ecosystems-ERIC (AnaEE),
- Aquaculture for Excellence for Aquaculture in Fish (AquaExcel),
- Infrastructure for Promoting Metrology in Food and Nutrition (METROFOOD)
- International Council for Exploration of the Sea (ICES)
- Research Infrastructure for Science and Innovation Policy Studies (RISIS).

1.2 The AQUASERV TA Programme

1.2.1 Services included in the AQUASERV TA Programme

1.2.1.1 What can be covered by AQUASERV TA funding?

There are three different types of access in AQUASERV: on site, remote, and virtual. Only on-site and remote access are part of the TA programme, for which a research proposal needs to be submitted and subject to a selection process (see Section 3 – Transnational access: Step-by-step guide for more information). Virtual access is free and does not require a selection.

If a TA application for on-site or remote access is successful, AQUASERV can cover the following costs :

- Specific techniques/instrumentation needed for the project
- Remote provision of services or material
- General consumables/materials required for the project (e.g. some chemicals).
    - Note: If required, the Access Provider can purchase special consumables/materials not included in the list of general consumables/materials for the TA project, to be charged to the user's institution. The applicant should contact the Access provider to discuss specific needs before applying.
- Travel, accommodation, and subsistence (for on-site access, max. 2 persons per project) for up to 3 months (depending on the nature of the project and the availability of funds).
- TA projects belong to the applicants/users and can be implemented independently at the Access Provider facilities. However, if convenient, users, of their own free will, may choose to collaborate with the Access Provider's research and technical staff in implementing the TA project.

On-site users can access office space, laboratories, and consumables/materials. Service staff provide training in instrumentation and provide advice if required. Some hosts can provide in-house lodging or assist with reserving nearby accommodation.

1.2.1.2 Overview of service categories and types

A list of categories (in bold) and sub-categories of available AQUASERV services is given below. More information about the facilities providing these services can be found in Section 2 of this handbook. Applicants can browse the service catalogue on the AQUASERV website[1].

Behaviour and welfare monitoring
Behaviour and welfare monitoring

Biobanks
Biobanks

Chemical and biochemical analysis
Bioassays
Biochemical and biogeochemical analysis
Calorimetry
Liquid and gas chromatography
Mass spectrometry
NIR-Spectroscopy
Serology

Culture and rearing facilities
Culture facilities for bacteria
Culture facilities for eukaryotic cells
Culture facilities for fish and invertebrates
Culture facilities for macroalgae
Culture facilities for microalgae
Culture facilities for viruses
Insect rearing farm

Disease infection facilities
Infection facilities for challenge trials

e-Services
Bioinformatics
Datasets
Spatial planning
System Biology Modelling

Experimental facilities
Climate-controlled rooms
Dry processing laboratories
Mesocosms and artificial ecosystems
Recirculating aquaculture systems (RAS)
Wet processing laboratories

Feed testing and production
Feed production
Live feed experiments

Fieldwork, ecosystem access, and telemetry
Coastal research vessels / Boats
Environmental monitoring and sampling
ROVs and underwater video
Scientific diving
Telemetry

Food & feed quality, safety, and packaging
Food & feed quality and safety
Food packaging
Food traceability

Microscopy and imaging
Absorbance and Fluorescence Spectrometry
Electron microscopy
Flow cytometry
Fluorescent and confocal microscopy
Light microscopy
Live cell imaging

Molecular biology and omics
Cell transplantation
Genotyping, genomics, selective breeding
In-situ hybridization
Preparation of test vaccines
Sequencing

Taxonomic services
Taxonomic services

[1] https://www.aquaserv-ri.eu/transnational-access

1.2.1.3 Overview of partners

AQUASERV comprises a network of six European research infrastructures, gathering 40 scientific partners covering research and innovation for sustainable aquaculture, fisheries, and the blue economy. Through this network, AQUASERV offers service coverage in 16 countries around European seas (Baltic, Northeast Atlantic, and Mediterranean) and inland waters.

A list of the Access Providers is provided in Section 2 of this handbook and on the Partners page on the AQUASERV website[2].

1.2.2 Eligibility criteria

To be eligible for AQUASERV Transnational Access (TA) services, applicants must meet the following criteria:

Eligible Applicants:

- PhD students, researchers, engineers, or other research professionals with a PhD, Master's, or engineering degree
- Affiliation to a recognised academic institution, a not-for-profit research organisation, or a registered company

Transnational Requirement:

- The applicant's home institution must be in a different country from the selected Access Provider.
    - For projects with two applicants (i.e. one lead applicant and one co-applicant), both applicants' home institutions must be in a country different from the Access Provider.
    - For projects with more than two applicants, more than 50% of the team (e.g. 2 out of 3, 3 out of 4, at least 3 out of 5, etc.) have to be from a country different from the Access Provider. Please note: the team may include more than two users, but the AQUASERV TA funding will only cover the costs of up to two users per project.

[2] https://www.aquaserv-ri.eu/our-partners

Additional Eligibility Conditions:

- A Master's student can participate in the project team only to accompany an experienced researcher; however, AQUASERV will not cover their travel and subsistence costs. Bachelor's students are not eligible.
- The applicant must have an active contract with their home institution, ensuring insurance coverage and other necessary provisions during the access period.
- Researchers whose home institution is based in Russia are not eligible to apply. For more information, please see: International cooperation with Russia in research and innovation[3]
- If the TA project is accepted, applicants must agree to comply with the *European Code of Conduct for Research Integrity*[4] and to follow Responsible Open Science practices[5] including depositing the data obtained from the TA in a public archive (with exceptions allowed if based on a reasonable justification) and publishing Open Access. Please see Chapter 1.4 – Data Management for more details.

1.2.3 Selection criteria

Proposals will go through several steps of review and evaluation to ensure that they comply with the programme's priorities and ethics policy, are technically feasible, and have scientific merit. Chapter 1.3.2.3 – Review and selection describes the selection criteria and evaluation procedures.

[3] https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/europe-world/international-cooperation/bilateral-cooperation-science-and-technology-agreements-non-eu-countries/russia_en
[4] ALLEA (2023) The European Code of Conduct for Research Integrity – Revised Edition 2023. Berlin. DOI 10.26356/ECOC
[5] https://www.openaire.eu/ec-policies-and-mandates

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Overview of TA process

Pre-access

01 Preparation phase

page 12

Please read the eligibility and selection criteria.
The catalogue of services can be browsed in this handbook and on https://www.aquaserv-ri.eu.
Before applying for the selected services, it is strongly advised to contact the Access Provider and discuss the project design, needs, and estimated costs.

Pre-access

02 Proposal submission

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Open call: You can apply anytime at this link: https://aria.aquaserv-ri.eu. Follow-up requests will also be sent via this platform.
Challenge calls: A separate link will be provided every 8 months.

Pre-access

03 Review and selection

page 14

The review process consists of the following steps:

- Eligibility of the applicants
- Technical feasibility of the project
- Scientific review
- Financial check and final validation

During access

04 Service provision

page 17

Once the application is approved, the user will be asked to sign a hosting agreement with the Access Provider and fill out a data management plan (DMP).
The TA project will be carried out on site or remotely with the necessary assistance by the Access Provider.

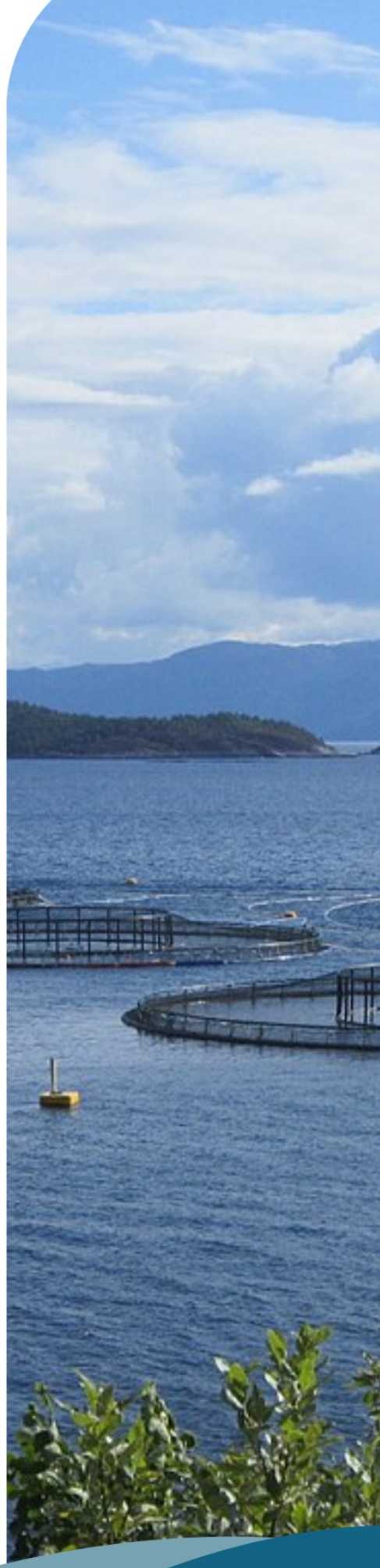
Post-access

05 Reports & publications

page 18

After completion of the TA project, every user is expected to

- submit an activity report (within 45 days)
- provide feedback via a survey
- make any resulting data Open Access (exceptions may apply)



1.3 Transnational access: Step-by-step guide

1.3.1 Overview

An outline of the steps that each project will go through, from the preparation phase to post-TA completion, is given on the previous page.
More details about each of these steps are provided in the following chapters of this handbook:

- 1.3.2 Pre-access procedures
- 1.3.3 During access: Service provision
- 1.3.4 Post-access procedures

The overall review process (i.e. the time between the submission of the application and the final decision) is expected to take up to four months, although this may vary depending on the date of submission. Once the application has been approved, the TA project will be planned and prepared in collaboration with the responsible Access Manager of the chosen facility.

1.3.2 Pre-access procedures and advice

1.3.2.1 Before applying

Browsing the service catalogue and facilities:
The access-providing facilities and available services are on the AQUASERV website[6] and in this handbook (see Section 2).
There are over 500 services available at 63 facilities.

Contacting the Liaison Officer or Access Manager:
Before writing the application, applicants are strongly advised to contact the Liaison Officer/Access Manager at the facility of their choice. The appropriate contact information for each access-providing facility is given in Section 2 - Access Providers of this handbook, and an overview table is provided in Appendix A2.

[6] https://www.aquaserv-ri.eu

The Access Manager can provide more detailed information about the available services and help design the TA project. Among the points to be discussed are the following:

- Project feasibility
- Specific techniques/instrumentation needed for the project
- Consumables/chemicals needed for the project
- Funds and travel and subsistence arrangements (for on-site access, max 2 persons per project)

Estimating costs

Please note it will be necessary to provide an estimate of the total costs of the proposed project in the application form. These costs of services, consumables, and travel and subsistence (for on-site access) to be covered by AQUASERV. The Access Manager of the chosen facility will be able to help calculate the approximate costs. Please also refer to the table in Appendix A2 for an overview of units of costs.

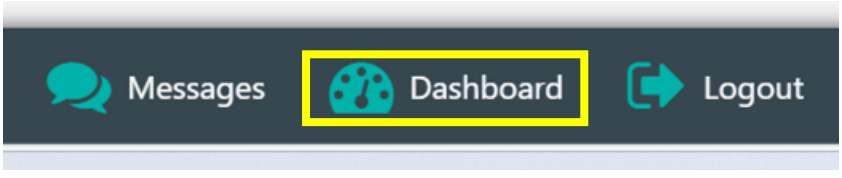
1.3.2.2 How to apply

Applications for Transnational Access are submitted online through the ARIA application system.

1. Go to https://aria.aquaserv-ri.eu/ and click on *Login/Register* in the top right corner.
2. Select one of the login options or scroll down to *Don't have an account?* and click on *Create one.* After completing this form, a confirmation email with an account activation link will be sent to the given email address.
3. Once the account is activated, browsing the catalogue and selecting the service(s) of interest will be possible.

Application submission on ARIA, step by step:

- Step 1: Select the service(s) to be applied for and add them to the basket. The services selected can be seen by clicking the Dashboard button in the bottom right corner. Click on *Continue Proposal* to start the application process.



- Step 2: Confirm the selected services.

- Step 3: This is the proposal form, i.e. the main application form, where information about the team and the project is added. Applicants are asked to fill out questions about the lead applicant and any

co-applicants, about scientific and technical details of the project, and questions related to ethics policies and data management. Hover above the question mark icon next to each question to receive more instructions (see screenshot below). Mandatory questions are marked with an asterisk. The draft can be saved to come back to the form later.

- Step 4: Here, team members can be added to view and edit the proposal. Please note that they need to register on ARIA beforehand to be able to add them at this stage. Note: The *Principal Investigator* is the TA project leader, i.e. the main applicant. The *Home Lab Colleagues* are the other Users in the project.

- Step 5: Exclude reviewers with potential conflicts of interest.

- Step 6: This step allows reading through the application before submission.

- Step 7: The proposal is ready for submission. Once this step is performed, it is not possible to modify any aspect of the proposal. By submitting the proposal, the applicant agrees to the AQUASERV Terms of submission.

Applicants can view proposal drafts and submitted proposals and track their status by selecting *View Proposal* in the dashboard. Applicants will be notified by email about the result of their application.
In case of any technical issues or any questions about the application process, please contact the Access Officer at stella.alexandroff@embrc.eu.

After application submission:
The Access Officer will check whether the applicant meets the eligibility criteria and forward any eligible application to the respective Access Manager(s) for a feasibility check. If the application passes through these two initial checks, it will be forwarded for scientific review and validation by the User Selection Panel. More details about this process are given in the next chapter.

1.3.2.3 Review and Selection

AQUASERV offers two types of calls: A rolling call that remains open for the entire duration of the AQUASERV TA programme and accepts proposals that comply with any of the programme's priorities ("open call"), and targeted calls that will be published every eight months and seek proposals that comply with a specific challenge and EU policy ("challenge-driven call").

Selection timeline:

- Open call: Proposals can be submitted at any time and will be evaluated on a rolling basis. Proposals that pass the feasibility screening will be evaluated every four months.
- Challenge-driven call: Proposals will be evaluated at once according to the deadline indicated in the description of the specific call. The review process can take up to four months.

Exception: Proposals from Ukraine will be fast-tracked, i.e., given priority reviewing.

Eligibility check:

The Access Officer (AO) verifies the received applications for compliance with EU regulations and AQUASERV's eligibility criteria (see Chapter 1.2.2 – Eligibility criteria). Only eligible applications will be sent through to the next step.

Feasibility check:

The AO sends applications that pass the eligibility check to the relevant facility Liaison officers/Access Managers for technical feasibility checks (timing, availability of biological resources or equipment, logistics, etc.). The Access Managers do not evaluate the scientific quality of applications. The Access Managers can contact the applicant when performing the feasibility check to clarify requests.
Please note: Any project will have a higher chance of passing the feasibility check if the applicant has contacted the Access Manager of the relevant facility before submitting their application.

Scientific review:

Eligible and feasible applications are sent for peer review by at least two reviewers external to the consortium. Exceptionally, if not enough external reviewers are available within a reasonable time, one of the two reviewers may be internal to the consortium.The reviewers will evaluate the applications based on scientific merit using the selection criteria below.

Following the scientific review, the User Selection Panel (USP) will rank and select the proposals based on the external reviewers' assessments and scores. The USP comprises the AQUASERV Executive Committee and the external Scientific and Technical Advisory Board (STAB; see the *Our Governance* page on the website).

Selection criteria:

1. Scientific excellence: The quality, originality and ambition of the proposed work, as well as the potential scientific and technical outcomes and impacts of the project. The proposal's significance for the applicant's overall scientific work should be considered.
2. **Novelty:** The proposal should be innovative, testing new ideas or perspectives in the field. The novelty and significance of the project proposal in the context of international research and standards in the field should be explained.
3. **Overall feasibility/probability of delivery:** Applications should have realistic scientific goals that can be achieved in the context of the AQUASERV.
4. **Compliance with programme priorities:**
    a. Open call: Compliance with priorities of the AQUASERV programme, the European Common Fisheries Policy, the Farm to Fork Strategy, the Sustainable Blue Economy, the European Green Deal and EU Mission "Restore our Ocean and Waters by 2030" (e.g., sustainable aquaculture, sustainable fisheries, seafood quality, blue economy, marine biotechnology, ecological restoration, etc.)
    b. Challenge-driven calls: Compliance with the key priority as outlined in the specific call
5. **Need for access:** Applications should explain why access to the requested facility is needed to conduct their research.
6. **Compliance with the AQUASERV ethics policy.**

All things being equal, new users, early-career researchers, and users from Ukraine will be given preference.

Financial check:

The Access Managers assess the financial feasibility of the selected applications, considering the USP ranking order and funding constraints. The Access Managers report to the Access Officer which projects are accepted or not.

Acceptance/rejection:

The Access Officer informs the applicant via the ARIA platform/email about the funding decision. This response can be expected within four months after proposal submission.

1.3.2.4 Hosting Agreement

For approved applications, the Access Manager prepares a Hosting Agreement (also called a User Access Contract), a legally binding document in which rules, obligations, and technical details of the TA Project are specified. The Access Manager sends a draft contract to the Applicant for revision and possible modifications within reason and according to the Grant Agreement / Consortium Agreement. The project is only finally accepted once the Applicant (User) and the Responsible for the Applicant's institution have signed the agreement.

The signing procedure and modality may differ between Access Providers. Access Providers may also require applicants to sign additional documents.

In case a TA project includes multiple Access Providers or the applicants are from different home institutions, a separate contract per institution and Access Provider may be required.

1.3.2.5 Insurance

Full health-, travel- and personal accident insurance is obligatory. It must cover the full period from arrival to departure. This is a cost not covered by the TA grant. Travel cancellation insurance is recommended, as AQUASERV does not reimburse cancelled tickets. Certain activities (e.g. diving) may require the visitor to obtain special insurance cover.

1.3.3 During access: Service provision

- On-site Users can access office space, laboratories and general consumables/materials.
- Service staff provide training in instrumentation and provide advice if required.
- The Host provides in-house lodging or assists with the reservation of nearby accommodation.
- The TA projects belong to the Applicants/Users and can be implemented independently at the Access Provider facilities. However, if convenient, Users, of their own free will, may choose to collaborate with the Access Provider's research and technical staff in implementing the TA project.
- Users are encouraged to provide a seminar about their TA project at the host facility.

1.3.4 Post-access procedures

1.3.4.1 Confirmation of access

The Access Manager prepares a "Confirmation of Access" form, which specifies the number of *Units of Access* delivered to the Users.
The TA Project leader (i.e. the main applicant) verifies the details and signs the form. The form is countersigned by the Access Manager or person in charge at the Access Provider. This is done as soon as possible following the access provision and no later than 30 days after the TA project is completed. The signed form is then forwarded to the AQUASERV Access Officer.

1.3.4.2 Reporting

Upon completing access to the services, Users are required to submit the following reports through the application system on ARIA:

Activity Report:
This is a brief report outlining the main achievements in relation to the initial objectives, highlighting potential outcomes, and identifying both actual and potential end-users of the results. The report must be submitted within 45 days after completing the TA project.

Feedback Report:
The TA project leader must answer a series of questions covering technical/scientific successes and non-scientific aspects, the quality of the services and overall TA experience, and noting challenges and shortcomings encountered during the TA.

The TA project leader will receive an email notification from ARIA with a link to the activity report and feedback questions.

1.3.4.3 Reimbursement procedure

Expenses related to travel, accommodation, and meals for on-site TA users (up to 2 persons per project) will be reimbursed after the TA project is completed and the User has signed the *Confirmation of access* form. The reimbursement procedure may differ between Access Providers. For specific information about the reimbursement procedure, the Access Manager of the hosting facility/Access Provider should be contacted directly (see Appendix A2 for an overview).

1.4 Data management and publications

1.4.1 Open Access publishing and FAIR principles

Data and publications produced within the AQUASERV Transnational Access and Virtual Access programme must follow FAIR principles[7] and be Open Access (Gold or Green standard[8]).

This means the following:

- Data should be published in data repositories and the link (e.g. DOI, URL) to these should be added to any scientific publications.
    - The raw data should always be shared in this way. If you experience problems (e.g. due to the size of the data) please send an email to the Access Officer at stella.alexandroff@embrc.eu.
    - The final data that are used in any scientific publication should also be published (if these are different to the raw data).
    - Those data should have a CC BY or CC 0 licence, although exceptions (e.g. embargo periods, IPR) are allowed upon consultation with AQUASERV.
- Scientific refereed publications must be published as Open Access documents, either directly with an Open Access publisher or by reposting the article in an Open Repository.
- Finally, the datasets being published should be Interoperable and be provided with provenance information.

To help you choose the appropriate journal, you can use the Journal Checker Tool[9] (provided by the initiative *cOAlition S*).
As soon as you publish an article from research funded by AQUASERV, please send an email to aquaserv@ualg.pt, including the title, DOI and PDF of the publication.

[7] https://www.go-fair.org/fair-principles/
[8] https://mcw.libguides.com/c.php?g=913436&p=8259374
[9] https://journalcheckertool.org/

1.4.2 Data management in AQUASERV

AQUASERV Users are required to:

- **Submit a Data Management Plan (DMP)**

The Data Management Plan (DMP) explains what type of data is being collected or created in a project and how it will be made FAIR.

- **Store the data**

Data generated during a TA project should be archived in a community standard database or repository where their long-term survival is guaranteed. The deposited data must also be described by metadata and linked to the data record if placed in a separate metadata catalogue. The metadata should be sufficiently detailed so that others can find, download, and re-use the data (i.e. ensuring that the data are FAIR).

It is a requirement that the outputs from the TA visit are ***as open as possible as closed as necessary***. This means that outputs should be made Open Access (i.e. available for all to find, read, and use; free at the point of access) unless there are reasons for not doing so – those reasons need to be provided to AQUASERV (aquaserv@ualg.pt).

You will be asked to agree to the following key points when you submit your application:

- I will submit a Data Management Plan (DMP) for my TA project following the AQUASERV template.
- I understand that any refereed publication authored by myself that includes results gathered during my TA visit will be published as Open Access.
- I understand that I will make the data I collect during my TA available through open access as soon as possible after collection: these “raw” data will be archived in public repositories with publicly accessible metadata records via which those data can be accessed by anyone. I understand that any subsequent “processed” data based on the “raw” data should also be made available through open access, but for these a temporary embargo (e.g. until a scientific publication is accepted) can be requested. I understand that there can be other exceptions to open access data publication where data will not be made accessible for example sensitive data, competing commercial interest). All requests for exceptions will be considered on a case-by-case basis by AQUASERV.

1.4.3 Preparing a data management plan

Data management is a critical component of any scientific project, whether it produces large or small amounts of data. A Data Management Plan (DMP) will describe how data resulting from TA project will be collected, saved, and shared (published), and how those data can be read and understood by others via sufficient metadata and the use of standard data types and data formatting.
In AQUASERV, successful TA project applications must provide a DMP before the project begins. The DMP will be approved before the TA visit (or remote access), and will continue to be updated and refined as necessary as samples and data are collected and processed. The DMP templates and instructions will be provided on notification of a successful application for TA access. Advice on data management and FAIR data will be provided via the AQUASERV website, training courses, and the Helpdesk (see below).

1.4.4 Acknowledging AQUASERV in publications

Outcomes resulting from work carried out with AQUASERV support (i.e., publication, patent, data, etc.) should be acknowledged as follows:
"Funded by the European Commission under grant agreement No 101131121, AQUASERV project".
As soon as you publish an article from research funded by AQUASERV, please send an email to aquaserv@ualg.pt, including the title, DOI and PDF of the publication.

1.5 Virtual access

AQUASERV enables access to extensive databases, software and other web services provided by three project partners:

- Jožef Stefan Institute (JSI)
- Vlaams Instituut Voor De Zee (VLIZ)
- International Council for the Exploration of the Sea (ICES).

The Virtual Access page on the AQUASERV website provides more information about these partners and their virtual services.

Unlike for TA services, there is no selection procedure for access to virtual services.

AQUASERV

Section 2

Access Providers

Section 2 – Access Providers

This section provides descriptions of the service-providing institutions and facilities (i.e. Access Providers), their services, and contact information. This information can also be browsed on the Partner page and Services page on our website.

An overview of all contact information and units of costs per institution/facility are given in Appendix A2.

2.1 Ghent University (UGENT)

Location: Ghent (Belgium)
Expertise: Aquaculture, Fisheries, Environment
Contact: Marleen Roelofs (marleen.roelofs@ugent.be)
Related Infrastructures: EMBRC

Support offered

For each request, the Access Manager will make sure that logistical, technical and scientific support is available. Visitors receive lab space, necessary access to buildings and facilities and can use them independently following clear instructions on the use of the facilities. When research with living animals is planned, the necessary certificates are required. A typical procedure for access involved initial joint planning (if possible: video conferencing), followed by TA attending the set-up and/or finalisation of the work. If the service request involves longer monitoring or routine activities, they can be executed by local staff only. Finalisation of the work includes collecting samples and data and arranging storage and transport of material. Note that all paperwork related to these activities are the responsibility of the user. Apart from logistical, technical and scientific support, users will be invited to participate in local scientific and social activities with the aim of fostering cooperation.

2.1.1 UGENT – Phycology

Website: https://phycology.ugent.be
Contact: Marleen Roelofs (marleen.roelofs@ugent.be), Olivier De Clerck (olivier.declerck@ugent.be)

UGent – Phycology Research Group: (1) growth chambers fit to set up lab-scale experiments in volumes up to 2 L, and larger pilot-scale experiments (200 L). Associated research infrastructure includes access to molecular lab facilities (strain identification), time-lapse and fluorescence microscopy, flow cytometry and PAM-fluorescence.

Services

At UGent – Phycology Research Group: (1) growth chambers fit to set up lab-scale experiments in volumes up to 2 L, and larger pilot-scale experiments (200 L). Associated research infrastructure includes access to molecular lab facilities (strain identification), time-lapse and fluorescence microscopy, flow cytometry and PAM-fluorescence.

Bioresources available

Macro-algal strains of commercial crop species (e.g. *Porphyra, Palmaria, Saccharina, Undaria, Ulva*) and seaweed-associated bacteria. In addition we maintain cultures of several model organisms (e.g. Dictyotales).

Modality of access

Access duration is service dependent ranging from weeks to months. For long-term experiments, users are expected to be present at least at the start and end of the service. Users will have the possibility to collect the raw experimental/analytical data. Upon request, data analysis or interpretation in cooperation with a local research group can be explored. The research visit should result in open data, scientific papers and communications and patents. Users will be stimulated to interact with Master students and early career scientists and invited to a guest lecture at the receiving institute.

2.1.2 UGENT - Artemia Research Centre

Website: https://www.ugent.be/bw/asae/en/research/aquaculture
Contact: Marleen Roelofs (marleen.roelofs@ugent.be), Vincent Vermeylen (vincent.vermeylen@ugent.be)

Lab of Aquaculture and ARC: (1) lab facilities for chemical, microbial and molecular analysis. (2) experimental facilities for gnotobiotic *Artemia* challenge trials (including challenge rooms with L2 biosecurity level), hatching trials and live feed enrichment trials. (3) wet labs with permanent access to filtered natural seawater, installed recirculating aquaculture system with extended filter systems and options to extend or build own setups. All wet labs are adjustable for finfish, crustacean or mollusc (larvi)culture.

Modality of access

Access can be remote for sample processing and analysis, challenge, hatching and enrichment trials. All other services will be on site. Access duration is service dependent ranging from weeks to months. For long-term experiments, users are expected to be present at least at the start and end of the service. Users will have the possibility to collect the raw experimental/analytical data. Upon request, data analysis or interpretation in cooperation with a local research group can be explored. The research visit should result in open data, scientific papers and communications and patents. Users will be stimulated to interact with Master students and early career scientists and invited to a guest lecture at the receiving institute.

2.2 Institute of Natural Sciences (RBINS)

Expertise: Aquaculture, Environment
Location: Bruxelles (Belgium)
Website: www.naturalsciences.be
Contact: Jan Vanaverbeke (jvanaverbeke@naturalsciences.be), Wannes De Clercq (wdeclercq@naturalsciences.be)
Related Infrastructures: EMBRC

Services

The (1) Artificial Hard Substrate Garden (AHSG), an *in situ* modular and customizable test facility that can be deployed in offshore dynamic marine environments for testing materials, spat collectors, etc., and can be supported by our (2) scientific diving team. The (3) Marine Taxonomic Reference Centre offers taxonomic expertise in fouling and non-indigenous species.

Support offered

For each request, the Access Manager will make sure that logistical, technical, and scientific support is available. Visitors receive lab space, necessary access to buildings and facilities and can use them independently following clear instructions on the use of the facilities. When research with living animals is planned, the necessary certificates are required. A typical procedure for access involved initial joint planning (if possible: video conferencing), followed by TA attending the set-up and/or finalization of the work. If the service request involves longer monitoring or routine activities, they can be executed by local staff only. Finalization of the work includes collecting samples and data and arranging storage and transport of material. Note that all paperwork related to these activities are the responsibility of the user. Apart from logistical, technical and scientific support, users will be invited to participate in local scientific and social activities with the aim of fostering cooperation.

Modality of access

Access can be remote for taxonomic support. All other services will be on site. Access duration is service dependent ranging from weeks to months. For long-term experiments, users are expected to be present at least at the start and end of the service. Expected output/deliverables for users. Users will have the possibility to collect the raw experimental/analytical data. Upon request, data analysis or interpretation in cooperation with a local research group can be explored. The research visit should result in open data,

scientific papers and communications and patents. Users will be stimulated to interact with Master students and early career scientists and invited to a guest lecture at the receiving institute.

2.3 University of South Bohemia in České Budějovice – Faculty of Fisheries and Protection of Waters (JU)

The Faculty of Fisheries and Protection of Waters at JU includes 5 facilities:

1. Institute of Complex Systems (ICS)
2. Institute of Aquaculture and Protection of Waters (IAPW)
3. Intensive Freshwater Aquaculture Units (IFA)
4. Laboratory of Fish Genetics and Reproduction and Hatchery (GRC)
5. Laboratory of Infectious Fish Diseases (LIFD)

A modern and multipurpose fish hatchery with a total area of 220 m^2 is designed for early stages fish experiments. Twelve circular tanks (6 m^3 in total) and four rectangular basins (12 m^3 in total) operated by two separated RAS are used for rearing the yearlings. Two RAS (2 x 8 m^3) are ready for experimental preparation of broodstock for controlled reproduction and another RAS is available for early rearing of juveniles (6 x 1.5 m^3). The facility provides the possibility to keep model species or juveniles in controlled conditions. Microscopes and equipment for analysis of fish spermatozoa motility, cryopreservation experiments, and semen analysis, instrumentation for germ cell and blastomere cryopreservation and micromanipulation are available. Fish cultivation experiments can be realised in aquariums, small or large tank systems, and pond systems. Tanks are designed to allow sampling of faeces or uneaten feed in sedimentation cones (digestibility studies). RAS and flow-through systems for aquariums and tanks are available. The large-scale RAS hall for intensive aquaculture of ongrowing or grow-out stock of different species includes two separated RAS, each system with a total water volume of 30 m^3, a controlled temperature, light, pH and oxygen regime, and the possibility to use ozone treatment for water sterilisation. The pond culture system includes a maximum of 9 experimental ponds with a total area of 0.16 or 0.08 ha, that can be used for the optimization of larval, juvenile, or marketable mono- or poly-culture of different fish species. The aquaponic hall provides the opportunity to perform a variety of projects focussed on joint fish cultivation and hydroponic plants cultivation. It consists of 6 independent RAS and 200 m^2 of greenhouse. The two analytical labs, four aquarium rooms, and a processing plant are equipped with instruments for proximate and amino acid analyses, sensory analyses, lipid, volatiles and oxidation analyses, vitamin and protein analyses, elemental analyses, and microscopy analyses. The infrastructure for infectious experiments on fish is available in the form of a controlled aquarium room. Blood and tissue sampling from experimental animals, culturing viruses on cell lines, performing in vitro

assays, culturing bacteria, isolating nucleic acids, PCR, qPCR and droplet digital PCR are available. The physical infrastructure is supported by the expert services which are available for almost all facilities of FFPW. Tank experiments can be automatically monitored by several camera systems with automatic data processing to provide the information about fish behaviour or fish appearance. The image processing software (LoliTrack, inhouse build software) can be used by the user to automatise experiments.

Expertise: Aquaculture, Food / Social, Data
Related Infrastructures: AQUAEXCEL
Location: Vodnany, České Budějovice, Nové Hrady (Czech Republic)
Website: www.frov.jcu.cz/en/
Contact: Malkusová Monika (mmalkusova@frov.jcu.cz), Petr Císař (cisar@frov.jcu.cz) – specific Access Managers are indicated for each JU facility below

Support offered

JU will provide suitable supervision and guidance for potential inexperienced users to properly carry out the work. The technical and management staff will be helpful with the overall project's implementation.

Modality of access

The Modality of access is actual costs. On average each user or user group is expected to stay 14 days at the IAPW (feeding trials, analyses of feed and fish quality, fish processing, optimisation of fish intensive culture), 14 days at the ICS (the typical access start with the analysis of the research problem/data, continue with the proposal of the solution and development of the solution of particular data), 14 days at the GRC (preparation of broodstock, realisation of experiments related to reproduction, physiology of reproduction, genetics, incubation of fertilised eggs and juvenile breeding, preparatory work in laboratory – preparation of samples, equipment set-up, calibration or operation, laboratory experiments or analyses, cryoconservation of gametes etc.), 14 days at the IFA (specific training related to intensive farming of high valuable fish or biological aspects of reproduction and culture of fish, preparatory work related experiment and set-up of experimental design, preparatory work in laboratory – treatment of samples, equipment calibration and measurement on analytic instrument), 14 days at the LIFD – experimental infection of fish (preferably carp) with koi herpes virus, carp edema virus, spring viremia of carp virus or Aeromonas hydrophila, sampling of blood and tissues, processing of samples (hematology, NAs isolation, PCR,...)

2.3.1 JU Institute of Complex Systems (JU-ICS)

Contact: Petr Císař (cisar@frov.jcu.cz)

Fish/aquatic animal imaging (available in combination with all installations of FFPW or at user site) followed by data processing. It includes problem analysis, proposition of the imaging solution and data processing using image processing and CNN processing. The typical tasks: Fish appearance analysis – colour (colour changes based on diet), shape (deformities) and patterns (symptoms detection), hyperspectral analysis. Behaviour analysis – behaviour (movement) of aquatic organisms or objects in the tanks or aquariums. The statistical parameters about the behaviour (speed, space distribution, direction, fish interactions) over the time can be produced.

Services

Fish/aquatic animal imaging (available in combination with all installations of FFPW or at user site) followed by data processing. It includes problem analysis, proposition of the imaging solution and data processing using image processing and CNN processing. The typical tasks: Fish appearance analysis – colour (colour changes based on diet), shape (deformities) and patterns (symptoms detection), hyperspectral analysis. Behaviour analysis – behaviour (movement) of aquatic organisms or objects in the tanks or aquariums. The statistical parameters about the behaviour (speed, space distribution, direction, fish interactions) over the time can be produced.

2.3.2 JU Institute of Aquaculture and Protection of Waters (JU-IAPW)

Contact: Jan Mráz (jmraz@frov.jcu.cz)

The Institute of Aquaculture and Protection of Waters (IAPW) offers a wide range of experimental and analytical services related to fish and feed quality, fish nutrition, feeding trials, culture of new fish species, etc. The innovation of fish processing, fish product recipes, marketing research, storage conditions, flesh yield of specific species, and so on are provided. Another key area is the technology of intensive aquaculture, RAS, and technologies for aquaculture waste valorization such as aquaponics.

Bioresources available

The IAPW operates year-round and offers a wide variety of fish species. However, most species are available seasonally, so it is crucial to consult in advance and plan organism availability for each visit.

While there is generally a plentiful supply of fish, scheduling is required to ensure that the desired species are ready for research or production during the intended timeframe.

2.3.3 JU Intensive Freshwater Aquaculture Units (JU–IFA)

Contact: Oleksandr Malinovskyi (omalinovskyi@frov.jcu.cz)

JU-IFA offers fish culture under RAS and pond conditions related to larval, juvenile, on growing, grow-out and broodstock stages, environmental stimulation of gametogenesis and final reproduction in broodstock, fish nutrition and feeding, optimization of fish husbandry, optimization of cultured conditions during all phases. Laboratories are enabled to assess the effects of xenobiotic on biochemical, chemical, haematological indices and histopathology in fish and crustaceans. Service/support of this installation will observe changes in the tissues of fish and crayfish exposed to tested substances on the level of gene expression and thus help us assess possible negative effects of these substances on the exposed organisms.

Bioresources available

JU-IFA operates year-round and offers a wide variety of fish species. However, most species are available seasonally, so it is crucial to consult in advance and plan organism availability for each visit. While there is generally a plentiful supply of fish, scheduling is required to ensure that the desired species are ready for research or production during the intended timeframe.

2.3.4 JU Laboratory of Fish Genetics and Reproduction and Hatchery (JU-GRC)

Contact: Vojtěch Kašpar (vkaspar@frov.jcu.cz)

JU-GRC is focused on reproduction-related experiments - broodstock management and the preparation for semi-artificial or induced reproduction, work with fish gametes, the study of fish sperm motility, cryopreservation of fish gametes, flow-cytometry, optical microscopy, image analysis, micromanipulations, genetic analyses (sequencing, fragment analysis).

2.3.5 JU Laboratory of Infectious Fish Diseases (JU-LIFD)

Contact: Veronika Piačková (piackova@frov.jcu.cz)

This facility is focused on dealing with fish infectious pathogens, and realisation of experimental infections and laboratory analysis related to this (PCR diagnostics, virus and bacteria cultivation etc.). Hematological examination, and biochemical analysis of blood plasma/serum is also possible.

Bioresources available

Specific pathogen-free pure breeds and hybrids of common carp (including Amur wild carp and koi), possibly also other species of freshwater fish (mainly cyprinids).

2.4 Denmark Technical University (DTU)

DTU AQUA is a fish experimental facilities and associated lab (dissection), with a fully equipped laboratory for cell and molecular biology, including GMO (DTU Aqua AAH).

Expertise: Aquaculture, Biotechnology
Related Infrastructures: AQUAEXCEL
Location: Kongens Lyngby (Denmark)
Website: https://www.aqua.dtu.dk/english/research/research-areas/fish-and-shellfish-diseases
Contact: Argelia Cuenca (arcun@aqua.dtu.dk), Jacob Schmidt (jacsc@aqua.dtu.dk)

The fish experimental facility at DTU AQUA, unit of fish and shellfish diseases comprises approx. 120 experimental tanks of various sizes (5, 180, 500 and 1000 litres). The experimental tank facilities can operate at various temperatures and salinities and both flow-through and recirculation systems can be made available in the tanks. It is also possible to carry out trials with different concentrations of CO_2 diluted in water. This guarantees that well-controlled trials can be conducted with a wide range of fish pathogens on most freshwater and saltwater fish and crustacean species.

The infrastructure includes:

- A Pathogen Free (SPF) Hatchery for supply of experimental fish, this unit is fully recirculated and is supplied only with softened freshwater;
- A quarantine unit, which can be supplied with both fresh and saltwater, where it is possible to house a variety of fish and crustacean species (e.g. seabass, lumpfish, salmonids, shrimps) and where it is possible to conduct vaccination trials and trials with non-infectious reagents;
- A highly contained experimental unit capable of housing challenge trials with all known fish pathogens (including notifiable infectious agents) and bioengineered organisms (GMO) under both fresh- and saltwater conditions. All water used in the highly contained unit is pasteurised before discharged, enabling us to conduct experiments with exotic and highly infectious pathogens;
- A fully equipped dissection laboratory for sample preparation is included in the experimental tank facilities. Infectious disease laboratory and fish cell bank. State-of-the-art laboratories for cell and molecular biology (Biosecurity level 2) are part of the infrastructure. These include a

virology and bacteriology lab for propagation and in vitro immunochemical characterization of the pathogens, a molecular laboratory for PCR and sequencing.

- A GMO laboratory is available, along with access to Fluidigm, Next generation sequencing and Matrix-assisted laser desorption/ionisation Maldi-Tof. Access to laboratories is guaranteed for processing of samples from the different TAs.

The Unit for Fish and Shellfish Diseases at DTU AQUA is being operated as accredited according to ISO 17025 and it hosts the European Union Reference Laboratory for Fish and Crustaceans Diseases and the OIE Reference Laboratory for VHS and is leading within research and diagnostics on Infectious fish diseases. The service team has in-depth experience in the handling, management, and care of fish and crustaceans at all stages. Areas of research: The group has its focus on disease prevention and control as pivotal cornerstone for development of sustainable aquaculture addressing UN SDGs #12 (Responsible consumption and production) and #14 (Life below water). The group encompasses expertise on virology, bacteriology, pathology and immunology. Examples of core topics functionally addressed with the tank facilities are discovery of virulence markers for viral pathogens, dissection of protective immunity following vaccination to tackle viral infection, disease and infection pathogenesis with emerging and known pathogens, alternative to antimicrobials (e.g. phages) for bacterial disease prevention and control.

Services

Services currently offered by the infrastructure: DTU AQUA AAH has a broad experience with viral and bacterial pathogens, furthermore the group has worked extensively with diseases of unknown aetiology. In experimental trials with infectious agents, fish are exposed to test agents by intraperitoneal or intramuscular injection, through cohabitation or by bath/immersion. Standardised infection models for fish rhabdoviruses, piscine orthoreovirus, RMS, and a number of bacterial diseases are available. Pharmacological assessments as well as on-site microbiome monitoring and testing of vaccine candidates are also offered, opportunity for dissecting immune response. Some of the major scientific achievements include:

- Determination and kinetics of pathogen load and immune response in fish towards viral and bacterial diseases with related studies in immunology;
- The pathogenicity testing of a large number of isolates of VHSV, including recombinant viruses (GMO);
- Several new putative emerging fish pathogens (PRV-1, PRV-3, PMCV in salmonids, Ranavirus in Lumpfish, RMS in rainbow trout, IHNV in salmonids) have been tested for their infectivity.

Support offered

Access to the different users is given for the fish experimental facilities, but also for the dry laboratories and bioinformatic analysis. All experimental work is conducted in close collaboration with scientists and technical personnel. Feed-back from the user to DTU AAH members is expected as a short presentation of results in seminar form with discussion.

Modality of access

The modality of access is combined cost and the unit of access is defined as system/day with one system defined as 24 small 8-liter tanks or to six 180-liter tanks or to four 1000-liter tanks or one working day in fully equipped laboratories (virology, molecular biology, histopathology, microbiology). It is possible to accommodate customized requests, combining different tank set up maintaining the proportion of time and tank space.

A typical access consists of 60 units of access (8 weeks). Prior to the actual start of access, a series of virtual meetings will be arranged to plan the trial(s) and laboratory work (if any), including decisions about tank set up, pretreatment of fish and decision about pathogens to be used. Personnel at DTU Aqua (AAH) will arrange the practicalities prior to the arrival of the applicant, aiming to start the trial immediately upon arrival.

Example of schedule on arrival:

1. Meeting with staff of the animal facilities, with information about biosafety measures in the high-containment facilities. Introduction to the experimental facilities, including wet laboratory facilities and laboratories.
2. Meetings with other potential collaborators at the Institute, including scientists, technicians and animal facility staff members. Introduction to the IT-facilities and establishment of office facilities.
3. Meeting with the Veterinarian holding the Animal Experiments License. Introduction to relevant laboratory work, e.g. cell culture, virus isolation, virus identification by immunochemical and/or molecular techniques, during participation in selected laboratory activities.
4. Preparation of fish tanks and start of the experiment. Placing of fish in tanks (1000-2000 fish might be included in a trial), infection, collection of samples (always comprehensive in order to avoid unnecessary duplication experiments) according to protocols, for own analyses or providing material for other partners.

5. Access to the different users is given for the fish experimental facilities, but also for the dry laboratories and bioinformatic analysis. All experimental work is conducted in close collaboration with scientists and technical personnel. Feed-back from the user to DTU AAH members is expected as a short presentation of results in seminar form with discussion.

2.5 Natural Resources Institute Finland (LUKE)

Luke's diverse research infrastructures are suitable frameworks for experimental research on renewable natural resources and are widely available throughout Finland.

Expertise: Aquaculture, Fisheries, Environment, Breeding and genomics
Related Infrastructures: AnaEE
Location: see specific information for each facility below
Website: see specific information for each facility below
Contact: Antti Kause (antti.kause@luke.fi)

2.5.1 LUKE Spatial planning of fish farm locations (LUKE-FINFGARMIS)

Location: Helsinki (Finland)
Website: https://www.luke.fi/en/services/the-finfarmgis-method-helps-to-assess-the-location-of-a-fish-farm
Contact: Antti Kause (antti.kause@luke.fi)

FINFARMGIS is a spatial planning service developed by Luke to be used in GIS-software to optimise the locations of fish farms in marine environments.

Services

FINFARMGIS is a spatial planning software and service for optimal fish farm locations, which considers different environmental, social and economical GIS-data criteria to identify the areas best suited to the various stages of fish farming. The service has been provided to entrepreneurs, researchers, municipalities and government facilities, and has been essential in the licensing processes of fish farms and in maritime spatial planning.

Support offered

The TA access includes Luke's technical work, scientific advisory and consultation so that inputs from the TA user can be analysed. In case travel is needed, Luke staff will aid in finding accommodation either within Luke's own accommodations or via external services.

Modality of access

Actual cost. Typical access depends on area size. For assessing suitability of a landscape of a single fish farm is 15 days and does not include the collection of GIS-data. Unit of access includes technical work, scientific advisory and consultation.

2.5.2 LUKE Mariculture research station (LUKE-PMRS)

Location: Parainen (Finland)
Website: https://is.gd/UsFoIE
Contact: Antti Kause (antti.kause@luke.fi)

PMRS for marine fish farming is suitable for research on fish nutrition, growth, behaviour and welfare, and the technology and biology of mariculture in cages, or in combination with RAS farming. Brackish water RAS comprises 12 tanks of 1.3m^3 in one or two temperature regulated recirculation with automated feeding system and condition monitoring. Outside there are 12 sea cages in open brackish water with automated feeding and monitoring. The station also includes facilities for gutting, sampling and on-site laboratory analysis equipment and sample storage.

Services

PMRS is a service to study open sea net pen aquaculture in combination with brackish water RAS in a set up relevant to aquaculture industry.

Bioresources available

Several species, including rainbow trout, European whitefish and pikeperch, have been used previously. Species to be used by the TA user are negotiable.

Support offered

The TA user will be supported by Luke's extensive, well-established international research community in the fields of breeding, wild fish populations, aquaculture, genomics and computational genetics, to which the users join. Luke will train TA users to utilise the infrastructures and the associated analytical tools and databases. Luke staff will aid in finding accommodation either within Luke's own accommodations or via external services.

Modality of access

Combined costs, unit cost defined as user group/week. Typical access depends on experimental design and can vary from 12 weeks to the entire growth season.

2.5.3 LUKE Biodiversity (LUKE-Enonkoski)

Location: Enonkoski (Finland)
Website: https://www.luke.fi/en/research/research-infrastructures/enonkoski-research-infrastructure
Contact: Antti Kause (antti.kause@luke.fi)

Luke Biodiversity opens access to study vitality of wild fish populations in relation to fisheries, environmental challenges including human-caused deterioration of aquatic environments and climate change, and genetic adaptation. The indoor infrastructure includes: 163 egg incubation units; 72 family-tanks (0.5 m^2); 11 fingerling tanks (2.1 m^2 - 12.7 m^2); 34 broodstock tanks (28 m^2 - 63 m^2); and 4 aquariums (2.1 m^2). There are 44 outdoor tanks, including experimental flow-through environments (63 m^2 - 113 m^2). There are globally unique fish strains of land-locked Atlantic salmon, brown trout and land-locked Arctic charr for which Luke maintains conservation programmes and the associated data collection and genetic analysis, including historical tissue samples. There is equipment and expertise for experiments with thousands of fish with individually tagged fish and data collection, including controlled family-based designs and specific matings.

Services

Luke Biodiversity offer services to study especially wild salmonids and their conservation using the above mentioned facilities, fish strains and expertise, especially -omics, genetics, conservation and selective breeding of wild and farmed fish, and provide support in the statistical genomic analysis of new and existing data sets. The work has resulted in an extensive scientific publication list and documented impact on the international industry and its environmental footprint.

Bioresources available

Strains of land-locked Atlantic salmon, European whitefish, brown trout and land-locked Arctic charr. Species are negotiable.

Support offered

The TA user will be supported by Luke's extensive, well-established international research community in the fields of breeding, wild fish populations, aquaculture, genomics and computational genetics, to which the users join. Luke will train TA users to utilise the infrastructures and the associated analytical tools and data bases. Luke staff will aid in finding accommodation either within Luke's own accommodations or via external services.

Modality of access

Combined cost. Typical access lasts between a few weeks to 1-2 years.

2.5.4 LUKE Laukaa aquaculture research station (LUKE-LARS)

Location: Laukaa (Finland)
Website: https://is.gd/KItJ0a
Contact: Antti Kause (antti.kause@luke.fi)

Laukaa aquaculture research station (LARS) is composed of different sectons: a) the "RAS laboratory" with 10 individual small-scale systems (500 L fish tanks) with stage-of-art water quality sensors (spectrometer, O^2, CO^2, pH) and computer vision cameras where data can be accessed online; b) the "RAS pilot", a 10 tn capacity system (four 5 m^3 fish tanks) connected to an external passive water treatment field for zero-discharge aquaculture research; c) the "Hybrid RAS", a versatile six tank system (500 L fish tanks), capable of switching from flow-through to partial-RAS and furthermore to full RAS enabling studies such as juvenile production and off-flavour management; d) a "Multi-tank RAS" with 20 x 400 L fish tanks which has been used for feed trials and to produce e.g. juveniles with different backgrounds for marine farming experiments.

Services

LARS is a service to study freshwater RAS technology for production and water cleaning, fish performance, off-flavours, product quality and feed development. Facilities have been used to by RAS industry, including start-ups, and in Nordic transnational co-operation.

Bioresources available

Rainbow trout and European whitefish (*Coregonus lavaretus*) are available at the farm. The species to be used is negotiable.

Support offered

The TA user will be supported by Luke's extensive, well-established international research community in the fields of breeding, wild fish populations, aquaculture, genomics and computational genetics, to which the users join. Luke will train TA users to utilise the infrastructures and the associated analytical tools and data bases. Luke staff will aid in finding accommodation either within Luke's own accommodations or via external services.

Modality of access

Combined cost, unit cost defined as user group/week in an installation. Typical access per installation is 8-12 weeks.

2.5.5 LUKE Selective breeding (LUKE-SelBreed)

Location: Laukaai (Finland)
Website: https://www.luke.fi/en/projects/jalo-kalaaineksen-valintajalostus
Contact: Antti Kause (antti.kause@luke.fi)

Luke Selective Breeding is open to access to study aquaculture breeding programmes, genomic selection, computational genomics, genomic determination of fish traits, bioinformatics and genome evolution. The indoor infrastructure includes: >263 egg incubation units; 260 family-tanks (0.5 m^2); 4 tanks for temperature and photoperiod manipulation (28 m^2); 20 fingerling tanks (3 m^2); and 44 broodstock tanks (7-50 m^2). There are globally unique family-based breeding programmes for rainbow trout (annually 200 families) and European whitefish *Coregonus lavaretus* (annually 40 families) whose genetic material are widely used by the aquaculture industry. The breeding programme for rainbow trout is one of the world's largest and longest running, with pedigree, phenotype, tissue samples and genomic data collected since the late 80's. There is equipment and expertise for small and large family-based experiments with specific matings.

Services

Luke Selective Breeding offers services to study -omics, genetics, conservation and selective breeding of farmed fish, and support in the statistical genomic analysis of new and existing data sets and tissue samples. The work has resulted in an extensive scientific publication list and documented impact on the international industry and its environmental footprint.

Bioresources available

Rainbow trout and European whitefish *Coregonus lavaretus* with known family background (and genotype.)

Support offered

The TA user will be supported by Luke's extensive, well-established international research community in the fields of breeding, wild fish populations, aquaculture, genomics and computational genetics, to which the users join. Luke will train TA users to utilise the infrastructures and the associated analytical tools and databases. Luke staff will aid in finding accommodation either within Luke's own accommodations or via external services.

Modality of access

Actual cost. Typical access lasts between a few weeks to 1-2 years.

2.5.6 LUKE Otolith laboratory (LUKE-Otolab)

Location: Helsinki (Finland)
Website: https://www.luke.fi/en/research/research-infrastructures/otolith-laboratory
Contact: Antti Kause (antti.kause@luke.fi)

The Otolith laboratory prepares and analyses fish otoliths and other calcified structures for age determination (e.g. herring and whitefish), a service that is used e.g. in the Northern Baltic Sea by ICES. The same method can be used to process other fish species and teeth from mammals, for example, seals, reindeer, moose, deer and roe deer.

Support offered

The TA user will receive advice on sample preparation and the full technical work to get analytical results. The TA user will be supported by Luke's extensive, well-established international research

community in the fields of breeding, wild fish populations, aquaculture, genomics and computational genetics, to which the users join. Luke will train TA users to utilise the infrastructures and the associated analytical tools and databases. Luke staff will aid in finding accommodation either within Luke's own accommodations or via external services.

Modality of access

Unit cost. The size of the project depends on the number of samples to be analysed.

2.6 Station Biologique de Roscoff (SBR)

The Station Biologique de Roscoff (SBR) is a research and training center in marine biology and oceanography and was founded in 1872 by Henri de Lacaze Duthiers, Professor at the Sorbonne University. Based on the high biodiversity and variety of habitats in the area. Today, it has become a world-renowned research and training centre in marine biology and ecology, with circa 300 staff on a 20.000 m2 campus, jointly operated by the Sorbonne Université (SU) and the French National Centre for Scientific Research (CNRS). The Station Biologique de Roscoff is part of the National Infrastructure EMBRC France – French node of EMBRC.

Location: Roscoff (France)
Website: https://www.embrc-france.fr/en
Expertise: Aquaculture, Fisheries, Biotechnology
Contact: Nathalie Turque (nathalie.turque@embrc-france.fr), Cécile Cabresin (cecile.cabresin@sb-roscoff.fr)
Related Infrastructures: EMBRC

Mission and research

SBR's missions are (1) to promote research and training on the biology of marine organisms and ecosystems; (2) to provide access, both for staff and non-resident researchers, to the ecological and biological resources of the site; (3) to carry out long-term observations of the physical, chemical and biological characteristics of the coastal environment in the vicinity of Roscoff; (4) to contribute to the regional ecosystem of innovation.

Research covers aspects from genes to the marine environment and includes the study of biological processes in marine organisms, the discovery of bioactive molecules of marine origin for potential therapeutic applications, the study of the marine environment and the way it shapes ecosystems, populations and organisms, and the functional and evolutionary processes that structure marine biodiversity.

Services

Ecosystem Access: groups the seagoing ("moyens à la mer") services of the three marine biological stations SBR, OOB, and IMEV. Each station has a diving team with scientific background, several small boats, and one >10 m coastal research vessel with crew, the latter operated by the French Oceanographic

Fleet (FOF), in coordination with EMBRC-France. “Moyens à la mer” offers the expertise and equipment of diving teams and oceanographic vessels for accessing the ecosystems and marine organisms located nearby the three biological stations. Altogether the ecosystems and biological resources accessible present a high diversity, ranging from Atlantic to Mediterranean habitats, including a megatidal system and deep / open ocean environments related to the presence of near-shore canyons at two of the locations. The three >10m coastal research vessels operate up to 20 miles offshore, whereas the 7 smaller boats allow the versatility required for near shore sampling and experimentation. All three stations are involved in EMOBON project and therefore follow its standardised protocols.

Biological Resources: groups the collection of wild organisms from the coastal ecosystems near to the stations, the access to unique microorganism collections (Roscoff Culture Collection with more than 6000 strains, Banyuls Bacterial Culture Collection with bacterial strains of bioprospecting interest, the Mediterranean Culture Collection of Villefranche, specialized on dinoflagellates, and the collection of mutant strains of diatoms), a biobank of fixed strains (the Center for Planktonic Collections de Villefranche) and the rearing of aquatic organisms in experimental conditions (aquaria, mesocosmos, etc.), including the whole life cycle of many aquatic model organism.

Technological Platforms: offers access to a suite of cutting-edge instruments specialised (but not restricted to) the analysis of samples of marine origin. The service includes sequencing/genomic analysis (Genomer, Bio2Mar), imaging (PIM, PIQ, MerImage, BioPIC) and structural analysis (Bio2Mar, CrystalO, Metabomer). Equipment includes Sanger and next generation sequencers, qPCR, optical and electron (SEM/TEM) microscopes, flow cytometers (FCM), cell-sorters (FACS) quantitative imaging devices, gas and liquid chromatography (GC, HPLC) and a variety of mass spectrometers (GC-MS and LC-MS), and an X-ray diffraction system. Technical staff provide expert advice and assistance for sample preparation, analysis and data processing steps. The equipment and the expertise of the scientific-technical staff allow the identification, isolation and characterisation of compounds produced by marine organisms; the genotyping of marine organisms; studies on biodiversity based on genomic or image analysis; studies on the development of different marine organisms.

Hosting services: the external visitors have access to working (office, laboratory space, meeting rooms) and living (hosting and catering) spaces for facilitating their presence on the stations.

Bioresources available

- **Culture collections** *(On-site and remote service)*
  - Roscoff Culture Collection (RCC) maintains over 5000 strains of marine phytoplankton, bacteria and viruses.
  - Microalgae
    - cyanobacteria: *Synechococcus* and *Prochlorococcus*;
    - prasinophytes: *Ostreococcus tauri*, *Bathycoccus prasinos* and *Micromonas pusilla*;
    - coccolithophore: *Emiliania huxleyi*
- **Marine model organisms** *(On-site and remote service)*
  - Access provided on-site and remotely of:
    - Dogfish (*Scyliorhinus canicula*) eggs
    - Ascidians (*Ciona intestinalis, Phallusia mammilata*)
    - Sea urchin (*Paracentrotus lividus*)
    - Acoel (*Symsattigifera roscoffensis*)
- **Species collected upon request** *(On-site and remote service)*
  - Collection and supply of local marine flora and fauna specimens from Morlaix Bay / Brittany coast (collection on foot, by diving or by boat)
  - All organisms can be provided on site / most organisms can be sent to external labs

Support offered

Scientific and technical support will be provided already at the preparation of the proposal to be presented in each TA call, in order to suit the user's needs. The potential users will be supported from the beginning by the Access Managers to 1) identify the services more suitable to their needs, 2) identify the scientific-technical contact that would contribute in the preparation of the proposal, and 3) support the user in the presentation of the request. Once the access request is accepted, the Local Access Officer will support the user from the logistic and administrative point of view, providing the information for reaching the station and tracking the documents that will allow the presence of an external user in the station (host agreement, badges, etc.). During the project execution, the user will have continuous technical and scientific support. The possibility of being hosted in the station, supported by the Hosting services, boosts the interaction with the larger scientific and technical community of researchers at the station.

Modality of access

The user would have access to 1) a wide range of microorganisms of aquaculture interest, both as feed for larval stages or filter feeding aquaculture organisms, and as source of compounds of interest (such as omega-3, vitamins, pigments, etc.)., 2) organisms of interest for aquaculture production such as macroalgae, 3) aquaculture facilities of different scales (from aquaria to mesocosmos) and circulation systems and 4) analytical platforms on-site that allow an immediate, almost real-time analysis of the experimental set up.

2.7 Observatoire Océanologique de Banyuls-sur-mer (OOB)

The Oceanographic Observatory of Banyuls-sur-mer (OOB), also called Laboratoire ARAGO, was founded in 1882 by the Sorbonne zoologist Henri de Lacaze-Duthiers in a location with exceptional marine biodiversity and well situated for oceanographic studies. As recognition of this hot spot for marine biodiversity, the first Marine Reserve in France was established in Banyuls in 1974. The second National Marine Park in France and the first marine protected area on the French Mediterranean coast was created in 2012, with a large perimeter including the deep Lacaze–Duthiers canyon of Banyuls-sur-Mer. OOB provides TA services for ASSEMBLE Plus, for which Sorbonne Université (SU) is the French partner.
Since its inception, the main tasks of the Observatory have been to train future generations of scientists, to conduct research, to insure the monitoring of the coastal environment and to allow the public to discover the marine and terrestrial biodiversity of the area. Research is conducted in several marine research areas such as marine biology, microbiology, biogeochemistry, marine ecology, integrative and evolutionary biology and biotechnology. There is a focus on the study of biodiversity and the effects of environmental disturbance on organisms and ecosystems. OOB has research links with the pharmaceutical and cosmetics company, Pierre Fabre Laboratories. Other companies at the interface of public health and the environment collaborate with the Observatory. Principal partners are EDF, Veolia Environnement, Microphyt and Microbia Environnement. Microbia Environnement is a start-up company which emerged at and is hosted by the OOB.

Location: Banyuls-sur-mer (France)
Website: https://www.embrc-france.fr/en
Expertise: Aquaculture, Fisheries, Biotechnology
Contact: Nathalie Turque (nathalie.turque@embrc-france.fr), Julie Boeuf (julie.boeuf@obs-banyuls.fr)

Services

Ecosystem Access: groups the seagoing (“moyens à la mer”) services of the three marine biological stations SBR, OOB, and IMEV. Each station has a diving team with scientific background, several small boats, and one >10 m coastal research vessel with crew, the latter operated by the French Oceanographic Fleet (FOF), in coordination with EMBRC-France. “Moyens à la mer” offers the expertise and equipment of diving teams and oceanographic vessels for accessing the ecosystems and marine organisms located nearby the three biological stations. Altogether the ecosystems and biological resources accessible present a high diversity, ranging from Atlantic to Mediterranean habitats, including a megatidal system

and deep / open ocean environments related to the presence of near-shore canyons at two of the locations. The three >10m coastal research vessels operate up to 20 miles offshore, whereas the 7 smaller boats allow the versatility required for near shore sampling and experimentation. All three stations are involved in EMOBON project and therefore follow its standardised protocols.

Biological Resources: groups the collection of wild organisms from the coastal ecosystems near to the stations, the access to unique microorganism collections (Roscoff Culture Collection with more than 6000 strains, Banyuls Bacterial Culture Collection with bacterial strains of bioprospecting interest, the Mediterranean Culture Collection of Villefranche, specialized on dinoflagellates, and the collection of mutant strains of diatoms), a biobank of fixed strains (the Center for Planktonic Collections de Villefranche) and the rearing of aquatic organisms in experimental conditions (aquaria, mesocosmos, etc.), including the whole life cycle of many aquatic model organism.

Technological Platforms: offers access to a suite of cutting-edge instruments specialised (but not restricted to) the analysis of samples of marine origin. The service includes sequencing/genomic analysis (Bio2Mar), imaging (BioPIC) and structural analysis (Bio2Mar). Equipment includes Sanger and next generation sequencers, qPCR, optical and electron (SEM/TEM) microscopes, flow cytometers (FCM), cell-sorters (FACS) quantitative imaging devices, gas and liquid chromatography (GC, HPLC) and a variety of mass spectrometers (GC-MS and LC-MS), and an X-ray diffraction system. Technical staff provide expert advice and assistance for sample preparation, analysis and data processing steps. The equipment and the expertise of the scientific-technical staff allow the identification, isolation and characterisation of compounds produced by marine organisms; the genotyping of marine organisms; studies on biodiversity based on genomic or image analysis; studies on the development of different marine organisms.

Hosting services: the external visitors have access to working (office, laboratory space, meeting rooms) and living (hosting and catering) spaces for facilitating their presence on the stations.

Bioresources available

- Culture collections (On-site and remote service)
    - The Banyuls Bacterial Culture Collection (BBCC)
        - Contains more than 2500 heterotrophic bacterial strains. Microorganisms were isolated from oceanographic cruise samples: from oligotrophic waters to the most eutrophic, at the water interface with air or sediments, or from the water column.

        - It also contains symbiotic bacteria associated with plants (macrophytes, seaweeds) and animals (sea urchin, jellyfish). Each strain is identified with a unique BBCC code and genetically characterized (16S rRNA). All the strains are available under a Material Transfer Agreement (MTA).
- Marine model organisms (On-site and remote service)
    - *Paracentrotus lividus* (eggs), *Aurelia aurita* (polyps and ephyrules), Zebrafish (eggs and larvae), *Amphiprion ocellaris* (eggs and larvae), *Pocillopora damicornis* (frags and eggs), Dogfish (eggs)
- Species collected upon request (On-site and remote service)
    - Collection and supply of local marine flora and fauna specimens by diving and at sea

Support offered

Scientific and technical support will be provided already at the preparation of the proposal to be presented in each TA call, in order to suit the user's needs. The potential users will be supported from the beginning by the Access Managers to 1) identify the services more suitable to their needs, 2) identify the scientific-technical contact that would contribute in the preparation of the proposal, and 3) support the user in the presentation of the request. Once the access request is accepted, the Local Access Officer will support the user from the logistic and administrative point of view, providing the information for reaching the station and tracking the documents that will allow the presence of an external user in the station (host agreement, badges, etc.). During the project execution, the user will have continuous technical and scientific support. The possibility of being hosted in the station, supported by the Hosting services, boosts the interaction with the larger scientific and technical community of researchers at the station.

Modality of access

The user would have access to 1) a wide range of microorganisms of aquaculture interest, both as feed for larval stages or filter feeding aquaculture organisms, and as source of compounds of interest (such as omega-3, vitamins, pigments, etc.)., 2) organisms of interest for aquaculture production such as macroalgae, 3) aquaculture facilities of different scales (from aquaria to mesocosms) and circulation systems and 4) analytical platforms on-site that allow an immediate, almost real-time analysis of the experimental set up.

2.8 Institut de la Mer de Villefranche-sur-mer (IMEV)

The Institut de la MEr de Villefranche (IMEV), formerly known as the Observatoire Océanologique de Villefranche-sur-Mer (OOV), is located on the Ligurian coast between Nice and Monaco in the bay of Villefranche which is known internationally for its richness of offshore pelagic organisms. IMEV was formerly a small research marine station. established in 1885 by Alexis de Korotneff (University of Kiev) and Carl Vogt (University of Geneva) in buildings leased from the Russian Navy. Since the 1930s, the facility has been administered by the University of Paris. Today, IMEV is composed of two joint laboratories (LBDV: Developmental Biology Laboratory and LOV: Oceanography Laboratory) and has become a world-renown research and training centre in marine ecology, oceanography and developmental biology, with about 200 staff on a 10,000 m2 campus. It is jointly operated by the Sorbonne Université (SU) (ex-UPMC), the French partner of ASSEMBLE Plus, and the French National Centre for Scientific Research (CNRS).
IMEV operates and maintains one of the three longest-running deep marine environmental monitoring stations in the world, and an important long-term pelagic observation programme. IMEV's research topics include developmental biology, pelagic and coastal oceanography at regional and global scales, biological and biogeochemical cycles in marine environment, carbon cycling, phytoplankton production and biological diversity of zooplankton communities.

Location: Villefranche sur mer (France)
Website: https://www.embrc-france.fr/en
Contact: Nathalie Turque (nathalie.turque@embrc-france.fr), Julien Lopez-Pardo (julien.lopez-pardo@imev-mer.fr)

Services

Ecosystem Access: groups the seagoing ("moyens à la mer") services of the three marine biological stations. Each station has a diving team with scientific background, several small boats, and one >10 m coastal research vessel with crew, the latter operated by the French Oceanographic Fleet (FOF), in coordination with EMBRC-France. "Moyens à la mer" offers the expertise and equipment of diving teams and oceanographic vessels for accessing the ecosystems and marine organisms located nearby the three biological stations. Altogether the ecosystems and biological resources accessible present a high diversity, ranging from Atlantic to Mediterranean habitats, including a megatidal system and deep / open ocean environments related to the presence of near-shore canyons at two of the locations. The three

>10m coastal research vessels operate up to 20 miles offshore, whereas the 7 smaller boats allow the versatility required for near shore sampling and experimentation. All three stations are involved in EMOBON project and therefore follow its standardised protocols.

Biological Resources: groups the collection of wild organisms from the coastal ecosystems near to the stations, the access to unique microorganism collections (Roscoff Culture Collection with more than 6000 strains, Banyuls Bacterial Culture Collection with bacterial strains of bioprospecting interest, the Mediterranean Culture Collection of Villefranche, specialized on dinoflagellates, and the collection of mutant strains of diatoms), a biobank of fixed strains (the Center for Planktonic Collections de Villefranche) and the rearing of aquatic organisms in experimental conditions (aquaria, mesocosmos, etc.), including the whole life cycle of many aquatic model organism.

Technological Platforms: offers access to a suite of cutting-edge instruments specialised (but not restricted to) the analysis of samples of marine origin. The service includes sequencing/genomic analysis (Genomer, Bio2Mar), imaging (PIM, PIQ, MerImage, BioPIC) and structural analysis (Bio2Mar, CrystalO, Metabomer). Equipment includes Sanger and next generation sequencers, qPCR, optical and electron (SEM/TEM) microscopes, flow cytometers (FCM), cell-sorters (FACS) quantitative imaging devices, gas and liquid chromatography (GC, HPLC) and a variety of mass spectrometers (GC-MS and LC-MS), and an X-ray diffraction system. Technical staff provide expert advice and assistance for sample preparation, analysis and data processing steps. The equipment and the expertise of the scientific-technical staff allow the identification, isolation and characterisation of compounds produced by marine organisms; the genotyping of marine organisms; studies on biodiversity based on genomic or image analysis; studies on the development of different marine organisms.

Hosting services: the external visitors have access to working (office, laboratory space, meeting rooms) and living (hosting and catering) spaces for facilitating their presence on the stations.

Bioresources available

- **Biobanks** *(On-site and remote service)*
    - > 20000 planktonic samples from worldwide & Tara expeditions (Ocean, Med, PolarCircle)
- **Marine model organisms** *(On-site and remote service)*
    - A large range of Metazoan Marine model organisms such as echinoderms (e.g. *Paracentrotus lividus*), tunicates (e.g. *Phallusia mammillata, Ciona intestinalis,*

Botryllus schlosseri), the cephalochordate *Branchiostoma lanceolatum*, cnidarians (e.g. *Pelagia noctiluca*, *Clytia hemisphaerica*).

- **Culture collections** *(On-site and remote service)*
    - Mediterranean Culture Collection of Villefranche (MCCV): collection of microalgae including the toxic dinogflagellate *Ostreopsis* isolated from the Villefranche Bay
- **Species collected upon request** *(On-site and remote service)*
    - Marine fauna and flora in situ Villefranche bay (chaetognaths, ctenophores, siphonophores..)

Support offered

Scientific and technical support will be provided already at the preparation of the proposal to be presented in each TA call, in order to suit the user's needs. The potential users will be supported from the beginning by the Access Managers to 1) identify the services more suitable to their needs, 2) identify the scientific-technical contact that would contribute in the preparation of the proposal, and 3) support the user in the presentation of the request. Once the access request is accepted, the Local Access Officer will support the user from the logistic and administrative point of view, providing the information for reaching the station and tracking the documents that will allow the presence of an external user in the station (host agreement, badges, etc.). During the project execution, the user will have continuous technical and scientific support. The possibility of being hosted in the station, supported by the Hosting services, boosts the interaction with the larger scientific and technical community of researchers at the station.

Modality of access

The user would have access to 1) a wide range of microorganisms of aquaculture interest, both as feed for larval stages or filter feeding aquaculture organisms, and as source of compounds of interest (such as omega-3, vitamins, pigments, etc.)., 2) organisms of interest for aquaculture production such as macroalgae, 3) aquaculture facilities of different scales (from aquaria to mesocosms) and circulation systems and 4) analytical platforms on-site that allow an immediate, almost real-time analysis of the experimental set up.

2.9 Université de Lorraine – Experimental Platform in Aquaculture (UL-EPA)

The Experimental Platform in Aquaculture (EPA) of the Université de Lorraine (UL), in Nancy (3 M€ of investment in 2014, 800 m^2) is modern indoor infrastructure dedicated to research on freshwater (cold to tropical) fish culture adapted to the different fish developmental stages (eggs, larvae, juveniles and breeders). EPA is composed of two Recirculating Aquaculture Systems (RAS) for eggs incubation, two RASs for larval rearing (5 tanks of 700 L each) and 16 individual, autonomous and identical RASs (tanks of 2m^3) for juveniles and breeders, completed by a specific area (4 RASs of 1700 L each) for fish acclimation. EPA also has a room with five independent hatcheries and a room (built in 2022) dedicated to the zebrafish with three zebrafish rearing systems, each with 50 aquaria. These facilities are all located in isotherm boxes to allow a very precise regulation and management of remotely controlled environmental factors (water temperature, photoperiod, light intensity, dawn and dusk simulation) with automatic archiving of data and automatic reporting of alarms for rapid and targeted action. The facilities are supported by laboratories dedicated to carry out physiological, cellular, and molecular analysis and it is equipped with apparatus to perform analysis of sperm quality by CASA, microscopy, cells and organotypic culture, western blot and in-situ hybridization, gel electrophoresis, ELISA, enzymatic assays, microassays, HPLC, PCR and more. EPA has been awarded in 2019 Lorraine University Excellence (3 stars), the highest standard for research facilities. PEA is mainly used in experiments related to the domestication of new freshwater fish species requiring optimization of the external factors for improving the rearing performances (e.g. larval rearing and growth, fish welfare, reproduction). The sophisticated automated control of these factors allows rigorous experiments with high level of traceability of the experimental features. It allows multifactorial studies in the framework of initial approach (screening) or more advanced approach (optimization of protocols). Around 3-5 international researchers per year work at the facility on average.

Expertise: Aquaculture
Related Infrastructures: AQUAEXCEL
Location: Nancy (France)
Website: https://is.gd/NF9337
Contact: Sylvain Milla (sylvain.milla@univ-lorraine.fr)

Services

PEA is mainly used in experiments related to the domestication of new freshwater fish species requiring optimization of the external factors for improving the rearing performances (e.g. larval rearing and growth, fish welfare, reproduction). The sophisticated automated control of these factors allows rigorous experiments with high level of traceability of the experimental features. It allows multifactorial studies in the framework of initial approach (screening) or more advanced approach (optimization of protocols). Around 3-5 international researchers per year work at the facility on average.

Support offered

Each user will be linked to a local group of researchers depending on the required technical and scientific skills (e.g. fish production, larval development, reproductive physiology, molecular biology). Together, they will discuss schedule and organize the experiments by considering the research goal, the sampling strategy and the competences required. According to these discussions it will be decided if access will be local or remote. Office with internet communication is included. Users will receive support to obtain project authorizations for animal experimentation and technical support for the management of experimental projects. An animal keeper will be available to follow the progress of the experiments. An assistant engineer will supervise the schedule and monitor the quality of the experiments. To optimize the feasibility of the protocols and ensure the reliability of the results, most of the tasks will be automated using computerized real-time data monitoring. A report containing a description of the experiment and the scientific data obtained will be written after each experiment.

Modality of access

On average each user or user group is expected to stay between 5 and 30 days (20 on average) at the infrastructure and multiple stays are possible. The combination of actual cost and unit cost will be used. The unit of access is defined as RAS/week. For eggs (hatchery), one project is expected to range between 4 and 16 units (i.e. 1 RAS during 4 weeks; 2 RAS during 8 weeks) and a maximum of 16 units per year. For larvae, one project is expected to range between 4 and 40 units (i.e., 1 RAS during 4 weeks; 10 RAS during 4 weeks) and a maximum of 40 units per year is authorized. For juveniles and breeders, one project is expected to range between 24 and 128 units (i.e. 6 RAS during 4 weeks; 16 RAS during 8 weeks) and a maximum of 200 units per year is authorized. Including the variety of RAS available, 72 RAS/week (units) would be used on average for each project, 72 being the average number of units counted for one typical project. A typical TA consists of the continuous maintenance of the RAS, measurements of water quality and morpho-anatomic indices, organ and blood sampling, storage of samples and access to the lab (biochemistry, molecular biology). All types of tanks of the EPA as well as the sampling room and the

analytical lab may be used by the users. The organization of the work will be co-managed by the user and the local researchers/technicians and the user's degree of independence will depend on its skills. Together with the local researchers and technicians, the users will organize and carry out the fish sampling and/or will help to perform the lab analysis. If necessary, users will attend specific training courses to fit with the good practices regarding fish experimentation.

2.10 Institut national de recherche pour l'agriculture, l'alimentation et l'environnement (INRAE)

INRAE Aquaculture composed of 4 installations:

1. INRAE-STPEE (Fish nutrition Farms and platform)
2. INRAE-PEIMA (Experimental Fish Culture Station of Monts D'Arrée)
3. INRAE-IERP (Fish Infectiology Platform)
4. INRAE-LPGP (Fish Physiology and Genomics Facility)

Expertise: Aquaculture, Biotechnology
Related Infrastructures: AQUAEXCEL
Location: see specific information for each facility below
Website: see specific information for each facility below
Contact: see specific information for each facility below)

2.10.1 INRAE Fish nutrition Farms and platform (INRAE-STPEE)

Location: St Pée sur Nivelle, Donzacq, Lees Athas (France)
Website: http://www6.bordeaux-aquitaine.inrae.fr/st_pee
Contact: Stéphane Panserat (stephane.panserat@inrae.fr)

INRAE-STPEE consists of 3 complementary platforms dedicated to nutrition of rainbow trout throughout the whole life cycle: Platform 1: Donzacq fish farm (17°C constant) has a feed manufacturing plant with a twin-screw extruder and wet labs, large (160 m3) and small scale (5000 and 200L) flow-through raceways, 36 50L tanks, 48 1m² tanks, 18 2m² tanks for juvenile nutrition. Platform 2: Lees Athas fish farm (7°C constant) comprises a hatchery for up to 400 groups of eggs; a UV-treated thermoregulated system to produce eggs and fry; 84 self-cleaning tanks for juvenile nutrition, 16 tanks of 200L, 32 tanks of 500L; 6 concrete tanks and 8 raceways of 12 to 20m3 for broodstock nutrition. Platform 3: 2 Specialized facilities, located at St Pée-sur-Nivelle, including: (1) 2 independent RAS systems each with 12 tanks, equipped with self-feeders to (i) monitor feeding rhythms, (ii) control feed distribution and (iii) evaluate the amount distributed.. The setup also enables feed choice experiments (2) 3 series of 6 cylindro-conical tanks in RAS with automatic faeces collector recognised by EIFAC as the most valid method for in vivo evaluation of apparent digestibility coefficients (ADC) of diets and ingredients. INRAE-STPEE can undertake all types

of nutrition research experiments, using rainbow trout (freshwater) as the main study-model. It has been actively used in experiments from EU projects from the 5thFP to H2020 (PEPPA, RAFOA, GUTINTEGRITY, FINEFISH, AQUAMAX, PROMICROBE, LIFECYCLE, AQUAEXCEL, ARRAINA, AQUAEXCELAQUAEXCELAEXCEL3.0). An AQUAEXCELength to the experimental infrastructure is the proximity of nutrition researchers which provides a healthy environment for scientific interaction and exchange.

Services

INRAE-STPEE can undertake all types of nutrition research experiments, using rainbow trout (freshwater) as the main study-model. It has been actively used in experiments from EU projects from the 5thFP to H2020 (PEPPA, RAFOA, GUTINTEGRITY, FINEFISH, AQUAMAX, PROMICROBE, LIFECYCLE, AQUAEXCEL, ARRAINA, AQUAEXCEL3.0). An AQUAEXCELength to the experimental infrastructure is the proximity of nutrition researchers which provides a healthy environment for scientific interaction and exchange.

Bioresources available

On-site access to rainbow trout is available on our fish nutrition platforms. The full life cycle of rainbow trout is also available, allowing experimental design with broodstock, alevin and juvenile nutrition.

Support offered

In addition to the above information, technical support for daily experimental work and technical help for samplings will be provided to all users. For specific needs, INRAE scientists using the infrastructures (genetics, nutrition, physiology, pathology) will assist users for experimental design and data interpretation.

Modality of access

Each user is expected to stay 12 weeks (duration of a typical nutrition trial).

Unit of access: tank/week

Type of access: on-site

2.10.2 INRAE - IERP

Location: Jouy-en-Josas (France)

Website: http://www6.jouy.inrae.fr/ierp

Contact: Christelle Langevin (dimitri.rigaudeau@inrae.fr, christelle.langevin@inrae.fr)

INRAE-IERP is dedicated to fish infectiology. It supports research programs on fish pathology, immunology, vaccinology, and genetics of resistance/susceptibility to diseases. EOPS rainbow trout and carp are available for infectious challenges. Trout are the INRAE reference strain or from isogenic lines with contrasted resistance to a range of pathogens produced at INRAE-PEIMA (collaboration agreement). IERP also has access to inbred carp families from WU. The fish installation (1000m²) consists in rooms for breeding pathogen-free fish with 4 RAS, 344 incubators or 86 aquaria, 18 tanks of 200L. The infectiology part (BSL2 confinement) has 104 aquariums in recycled or flow-through water, 14 tanks of 300L in recycling or in lost water. Imaging equipment enables fish monitoring and host-pathogens interactions through GMO pathogens with reporters. INRAE-IERP produces and supplies rainbow trout and carp with specific genetic and sanitary status, and performs in vivo infectiology experiments. Pathogens include both classical and emerging viruses and bacteria (trout: VHSV, IHNV, ISAV, Alpha virus SDV and SPDV, Flavobacterium psychrophilum; carp: SVCV). Experimental set-up benefits from the expertise of INRAE labs Molecular Virology and Immunology (VIM) and Animal Genetics and Integrative Biology (GABI). INRAE-IERP also comprises an imaging platform (clearing; biphotonic microscopy ...) in which new protocols are developed, including the usage of fluorescent pathogens to better monitor infections. The facility is part of the EMERG'IN research infrastructure and is also a partner of the VetBioNet infrastructure project.

Services

INRAE-IERP produces and supplies rainbow trout and carp with specific genetic and sanitary status, and performs in vivo infectiology experiments. Pathogens include both classical and emerging viruses and bacteria (trout: VHSV, IHNV, ISAV, Alpha virus SDV and SPDV, Flavobacterium psychrophilum; carp: SVCV). Experimental set-up benefits from the expertise of INRAE labs Molecular Virology and Immunology (VIM) and Animal Genetics and Integrative Biology (GABI). INRAE-IERP also comprises an imaging platform (clearing; biphotonic microscopy ...) in which new protocols are developed, including the usage of fluorescent pathogens to better monitor infections. The facility is part of the EMERG'IN research infrastructure and is also a partner of the VetBioNet infrastructure project.

Support offered

In addition to the above information, technical support for daily experimental work and technical help for samplings will be provided to all users. For specific needs, INRAE scientists using the infrastructures (genetics, nutrition, physiology, pathology) will assist users for experimental design and data interpretation.

Modality of access

Each user is expected to stay 5 days at the infrastructure (2.5 days at the beginning and 2.5 days at the end).

2.10.3 INRAE - PEIMA

Location: Sizun (France)
Website: https://www6.rennes.inrae.fr/peima_eng
Contact: Nicolas Larranaga (nicolas.larranaga@inrae.fr)

INRAE-PEIMA is the reference experimental unit at INRAE for research on all life stages of trout, mostly in physiology (reproduction, growth, behaviour, adaptation, etc.), genetics and nutrition. It offers a hatchery, 156 fry tanks of 200-400 L, 156 tanks of 2 m^3 and 26 tanks of 28 m^3, a behavioural study room with 20 tanks of 500 L and 16 video cameras, a semi-industrial recirculating aquaculture system (RAS) of 10 tanks of 6 m^3 linked with an aquaponic system, a RAS unit of 3 independent thermoregulated rooms (6°C to 18°C) linked with an aquaponics green house. INRAE-PEIMA also has a world unique collection of trout lines with original characteristics like growth, sex-ratio, fat content, spawning date, adaptation to plant-based diets, disease resistance, including 20 isogenic lines of rainbow trout. INRAE-PEIMA allows experimentation on all stages from eggs to large trout, including processing in a specialized facility. Access to trout isogenic lines requires a specific collaboration agreement. PEIMA hosts all INRAE research teams working on farmed salmonids (which can bring scientific support to visiting scientists) but also other research organizations or universities in France and Europe (e.g. Universities of Wageningen, Göteborg, Stirling, Vigo, and South Bohemia).

Services

INRAE-PEIMA allows experimentation on all stages from eggs to large trout, including processing in a specialized facility. Access to trout isogenic lines requires a specific collaboration agreement. PEIMA hosts all INRAE research teams working on farmed salmonids (which can bring scientific support to visiting scientists) but also other research organizations or universities in France and Europe (e.g. Universities of Wageningen, Göteborg, Stirling, Vigo, and South Bohemia).

Support offered

In addition to the above information, technical support for daily experimental work and technical help for samplings will be provided to all users. For specific needs, INRAE scientists using the infrastructures

(genetics, nutrition, physiology, pathology) will assist users for experimental design and data interpretation.

Modality of access

Each user is expected to stay 6 days, typically 3 days at the beginning of the experiment to finalize the technical protocol details and start the experiment and 3 days at the end of the experiment for final measurements and sampling

2.10.4 INRAE - LPGP

Location: Rennes (France)
Website: https://www6.rennes.inrae.fr/lpgp_eng/
Contact: Brigitte Guillet (jean-charles.gabillard@inrae.fr, brigitte.guillet@inrae.fr)

INRAE-LPGP is unique in France as it is accredited for the rearing of GMO fish of agronomic interest such as trout. It offers (i) genome editing (ii) behavioral phenotyping, (iii) germ cell grafting into surrogate larvae (iv) the ability to experiment over the entire life cycle by varying environmental parameters. It has 10 rearing rooms with 20 RAS systems, more than 100 large tanks (trout, pike, goldfish...) and more than 1000 small tanks for model species (zebrafish, medaka). It also contains a room dedicated to eggs microinjection for production of transgenic or genome edited fish. INRAE-LPGP proposes the production of transgenic or genome edited fish (Trout, model fish; GET service) that includes egg injection, genotyping and fish rearing up to reproductive stage. It also proposes a service for germ stem cell grafting (GCGraft service) into recipient embryos and the rearing of the surrogate fish up to one year. ISC-LPGP also proposes behavioural phenotyping of rainbow trout (video cameras, Ethovision software, behavioural maze setup).

Services

INRAE-LPGP proposes the production of transgenic or genome edited fish (Trout, model fish; GET service) that includes egg injection, genotyping and fish rearing up to reproductive stage. It also proposes a service for germ stem cell grafting (GCGraft service) into recipient embryos and the rearing of the surrogate fish up to one year. ISC-LPGP also proposes behavioural phenotyping of rainbow trout (video cameras, Ethovision software, behavioural maze setup).

Support offered

In addition to the above information, technical support for daily experimental work and technical help for samplings will be provided to all users. For specific needs, INRAE scientists using the infrastructures (genetics, nutrition, physiology, pathology) will assist users for experimental design and data interpretation.

Modality of access

On average each user or user group is expected to stay 5 days at the infrastructure to sampling or phenotyping of mutated trout (GET service) or grafted trout (GCGraft service).

2.11 Institut français de recherche pour l'exploitation de la mer (IFREMER)

2.11.1 IFREMER - Finfish marine station of Plouzané (IFREMER-FMSP)

Location: Brest (France)
Website: https://www-iuem.univ-brest.fr/lemar/?p=187233&lang=en
Contact: Fabrice Pernet (fabrice.pernet@ifremer.fr)

FMSP is located on the campus of Plouzané in the bay of Brest. FMSP is dedicated to multi-stress (temperature, pH, oxygen, contaminants, pathogens) and transgenerational experiments from early stages (gametes, larvae and post-larvae) to adulthood of finfish. Temperature, pH, oxygen and food are controlled under different stress conditions like organic pollutants, plastics or pathogens. FMSP uses sea bass and stickleback as model species, but experiments may also include seabream, sole, turbot or flounder (to be discussed). The experimental area is 800 m² corresponding to 10 experimental rooms (each housing 40L, 80L, 150L, 500L, 1000L, and 3000L tanks) under flow-through or recirculating conditions, 1 live-feed production room in small volumes, 4 wet laboratories, 6 dry laboratories, including one dedicated to bacteriological monitoring, feed manufacturing facility, numerous independent replicas, randomization of treatments, high statistical power. FMSP is fully equipped with microscopy and image analysis devices, a recording of larval behaviour (Ethovision), and an ecophysiological measurement system for food and oxygen consumption rates.

Services

FMSP offers the possibility to conduct short- and long-term multigenerational experiments under multistress and realistic conditions for all life stages.

Bioresources available

The main species on site are stickleback, sea bass, and sea bream from eggs to juveniles and adult fish. Rotifers, phytoplankton and artemias are also reared on site. Food is also formulated locally. FMSP produces pathogen-free oysters using a standardised procedure twice a year. These oysters are distributed for experimental purposes to various research institutions.

Support offered

The TA user will be supported by the local IFREMER staff, and a local research scientist will be appointed as first contact person. The supporting staff will advise the TA users about the IFREMER regulations, the experimental set-up, zootechnical procedures and maintenance in compliance with animal experimentation laws and regulations, device utilisation and sample storage. In addition, the administrative staff will assist in finding accommodation and transportation. The TA user will get access to a computer with internet access, scientific databases and local laboratories.

Modality of access

Modality of access cost is combined costs. Preference will be given for TA users to be present on site during the experiments. For longer experiments, the TA users should be present at the beginning and the end of the project for a minimum of 5 consecutive days. The TA user is responsible for the daily running of the experiment, coordination of the sampling and data analyses, in close relationship with local technical staff. Units of access include technical assistance with tasks that cannot be performed by the TA user. For FMSP, only larvae/juvenile rooms are open to TA.

2.11.2 IFREMER - Bivalve marine station of Argenton (IFREMER-BMSA)

Location: Argenton (France)
Website: https://www-iuem.univ-brest.fr/lemar/?p=187219&lang=en
Contact: Fabrice Pernet (fabrice.pernet@ifremer.fr)

BMSA is in a pristine area on the north shore of Brittany under oceanic influence far from urbanized watersheds, anthropogenic pressures and populations of wild bivalves. BMSA is dedicated to multi-stress (temperature, pH, contaminants, pathogens) and transgenerational experiments from early stages (gametes, larvae and post-larvae) to adulthood. Temperature, salinity, pH, turbidity and food are controlled under different stress conditions like pollutants and plastics, toxic algae, and pathogens. The experimental area is ~800 m^2 corresponding to 6 experimental rooms (each housing 5 L cylinders (larvae, n=36) 10 L tanks (spat, n=100), 45 L (spat, adult, n=50) or 400 L (n=16), allowing replication and high statistical power) under flow-through or recirculating conditions, 1 micro-algae production room in small volumes, 1 large-volume micro-algae production room (1200 L d^{-1}), 3 wet laboratories and a quarantine area, 3 dry laboratories. BMSA is fully equipped with microscopy and image analysis, two electronic particle counters (Bekman multisizer Z3 and Z4) for monitoring phytoplankton growth and controlling

food, a recording of larval behaviour (ethovision) and an ecophysiological measurement system allowing the monitoring of individual clearance, oxygen consumption and assimilation rates.

Services

BMSA offers the possibility to conduct short- and long-term multigenerational experiments under multistress and realistic conditions for all life stages.

Bioresources available

FMSP produces pathogen-free oysters using a standardised procedure twice a year. These oysters are distributed for experimental purposes to various research institutions.

Support offered

The TA user will be supported by the local IFREMER staff, and a local research scientist will be appointed as first contact person. The supporting staff will advise the TA users about the IFREMER regulations, the experimental set-up, zootechnical procedures and maintenance in compliance with animal experimentation laws and regulations, device utilisation and sample storage. In addition, the administrative staff will assist in finding accommodation and transportation. The TA user will get access to a computer with internet access, scientific databases and local laboratories.

Modality of access

Modality of access cost is combined costs. Preference will be given for TA users to be present on site during the experiments. For longer experiments, the TA users should be present at the beginning and the end of the project for a minimum of 5 consecutive days. The TA user is responsible for the daily running of the experiment, coordination of the sampling and data analyses, in close relationship with local technical staff. Units of access include technical assistance with tasks that cannot be performed by the TA user. For BMSA, TA project is expected to last between 1 week up to 6 months (BMSA). The unit of access is one fully equipped experimental room/week covering access to wet labs, dry labs, and phytoplankton production when necessary.

2.11.3 IFREMER Palavas experimental marine platform (IFREMER-PEMP)

Location: Palavas-les-Flots (France)
Website: https://umr-marbec.fr/recherche/dispositifs-de-recherche/dex/
Contact: Marie-Laure Begout (marie.laure.begout@ifremer.fr)

PEMP is located along the Mediterranean Sea near Montpellier and consists in 4000 m^2 dedicated to study finfish performances at the larval, juvenile or grow-out phase. MES: the marine ecotolerance section includes 2 sets of 16 tanks (1 m^3 each, flow-through or recirculated). Tanks are fitted with automatic feeders and fecal traps to fully control feed intake and uneaten feed. FLA: from larvae to adult fish. This section allows to grow fish from egg to commercial size for any type of long-term experiment in genetics and genomics. This facility consists in two thermally isolated room with 8 or 9 tanks (0.5m^3 each), one room with 16 tanks (1.5 m^3 each) and another one with 6 tanks (5 m^3 each, recirculated). For MES and FLA, light intensity and temperature can be controlled (0-500 lux, artificial dawn and dusk, 13-25°C), seawater is filtered (up to 30µm), UV-treated and degassed or O^2-enriched. Finally, the IMTA platform allows the evaluation of performances and bioremediation capacity of different species associated in different compartments. The first part of the IMTA platform is composed of 6 independent units made of 4-connected compartments: (a) a 4m^3 artificial aquatic ecosystem and its treatment system (particle trap, microbial bioreactor, gas column, UV control, thermic control), (b) an outdoor primary producer pond (1.5m^3), (c) another artificial aquatic system (0.4m^3), and (d) a secondary consumer aquatic system (0.5m^3). All compartments are possibly linked to each other with adjustable fluxes. The second part of the IMTA platform is composed of 24 independent tanks (60l). Salinity, temperature, pH and light are controlled.

Services

PEMP allows to complete any kind of experiments in zootechny, physiology, ethology, genetics and ecology, for seawater fish at different stages of development. PEMP offers training and TA services to AQUASERV.

Bioresources available

The main species on site is European seabass from eggs to juveniles and adult fish. A quarantine zone allows it to work with many other mediterranean species (from cephalopods to crustaceans, mollusks and fish). Rotifers, cryoplancton and artemias are also reared on site.

Support offered

The TA user will be supported by the local IFREMER staff, and a local research scientist will be appointed as first contact person. The supporting staff will advise the TA users about the IFREMER regulations, the experimental set-up, zootechnical procedures and maintenance in compliance with animal experimentation laws and regulations, devices utilisation and sample storage. In addition, the administrative staff will assist in finding accommodation and transportation. The TA user will get access to a computer with internet access, scientific databases and local laboratories.

Modality of access

Modality of access cost is Combined costs. Preference will be given for TA users to be present on site during the experiments. For longer experiments, the TA users should be present at the beginning and the end of the project for a minimum of 5 consecutive days. The TA user is responsible for the daily running of the experiment, coordination of the sampling and data analyses, in close relationship with local technical staff. Units of access include technical assistance with tasks that cannot be performed by the TA user. For PEMP, the TNA project should last at least 8 weeks and the unit of access is m3/month.

2.11.4 IFREMER Mollusk experimental platform of Bouin (IFREMER-MEB)

Location: Bouin (France)
Website: https://emma.ifremer.fr
Contact: Christophe Stavrakakis (christophe.stavrakakis@ifremer.fr)

MEB is located in the heart of the oyster hatchery/nursery region in the Bay of Bourgneuf. MEB is an experimental mollusc platform dedicated 1) to the growing of genetic lines of bivalve spat for experimental purposes and 2) to the testing of seawater treatment processes against chemical and biological (pathogen) contaminants. Animals are kept under realistic farming conditions and fed live phytoplankton. The experimental area is 2000 m^2 divided in three-unit areas. ENA: the experimental nursery area includes 2-7 m^3 raceways each containing 13 sieves (2 lines/sieve) supplied with phytoplankton-enriched (filtered/UV-treated) seawater at ambient temperature. EBA: the experimental breeding area for controlled contaminations consists in a 15 m^2 room supplied with controlled seawater quality (filtered, UV-treated and temperature controlled) equipped with tanks varying from 5 to 800 L capacity. Sewage can be treated using a high-performance medium lamp UV device. WER: the water treatment experimental room is 40 m^2 and designed to fit seawater treatment devices supplied continuously with controlled seawater quality.

Services

MEB allows producing large numbers of bivalve spats with varying genetic background and testing seawater treatment processes. MEB hosts scientists and shellfish farmers to carry out R&D studies.

Support offered

The TA user will be supported by the local IFREMER staff, and a local research scientist will be appointed as first contact person. The supporting staff will advise the TA users about the IFREMER regulations, the experimental set-up, zootechnical procedures and maintenance in compliance with animal experimentation laws and regulations, device utilisation and sample storage. In addition, the administrative staff will assist in finding accommodation and transportation. The TA user will get access to a computer with internet access, scientific databases and local laboratories.

Modality of access

Modality of access cost is Combined costs. Preference will be given for TA user to be present on site during the experiments. For longer experiments, the TA users should be present at the beginning and the end of the project for a minimum of 5 consecutive days. The TA user is responsible for the daily running of the experiment, coordination of the sampling and data analyses, in close relationship with local technical staff. Units of access include technical assistance with tasks that cannot be performed by the TA user. . For MEB, the unit of access is m²/week.

2.11.5 IFREMER Mollusk experimental platform of La Tremblade (IFREMER-MET)

Location: La Tremblade (France)
Website: https://emma.ifremer.fr
Contact: Christophe Stavrakakis (christophe.stavrakakis@ifremer.fr)

MET is located in the Marennes-Oléron area, well known for oyster farming. MET is dedicated to experiments on mollusk pathology, genetics and ecophysiology. The experimental area is 1200 m² dedicated to the production of genetic lines of several bivalve species (mainly oysters and mussels). The secured platform section consists of 390 tanks ranging from 8 to 800 L capacities distributed in 9 rooms dedicated to animal production and the conservation of selected strains or lines (quarantine area, broodstock conditioning, larval rearing, nursery, conservatory, phytoplankton production, experimental

rooms). Each room is currently being equipped with close systems (in case of pathogen outbreak outside the facilities) and individual temperature controller for each tank (8 to 25° C), supplied with filtered UV treated seawater. The outside platform section consists in 130 tanks (130 L to 12 m^3), tidal marshes (13400 $yard^2$), five offshore leases (5000 $yard^2$) and a phytoplankton production area (20 m^3/day). The secured dry/wet lab section allows conducting biometrics, cytogenetics and cytometry and experimental patho-physiology (L^2). Sewage is contained in a waterproof tank before treatment.

Services

MET is particularly suitable for pathophysiology and genetic experiments. MET is surrounded by two research labs dedicated to marine environmental and health studies (ca. 35 people) and include the national reference lab (NRL) for shellfish microbiology.

Support offered

The TA user will be supported by the local IFREMER staff, and a local research scientist will be appointed as first contact person. The supporting staff will advise the TA users about the IFREMER regulations, the experimental set-up, zootechnical procedures and maintenance in compliance with animal experimentation laws and regulations, device utilisation and sample storage. In addition, the administrative staff will assist in finding accommodation and transportation. The TA user will get access to a computer with internet access, scientific databases and local laboratories.

Modality of access

Modality of access cost is Combined costs. Preference will be given for TA user to be present on site during the experiments. For longer experiments, the TA users should be present at the beginning and the end of the project for a minimum of 5 consecutive days. The TA user is responsible for the daily running of the experiment, coordination of the sampling and data analyses, in close relationship with local technical staff. Units of access include technical assistance with tasks that cannot be performed by the TA user. For MET, TA is expected to last for at least 8 weeks for the secure/outside platform and 2 weeks for the secure laboratory section. For MET, the unit of access is m^2/week.

2.12 French National Centre for Scientific Research (CNRS)

Two experimental platforms (Aquatic Metratron and PLANAQUA) provide the possibility for scientists to study ecosystems in artificial environments or controlled in situ environments.

Expertise: Environment
Related Infrastructures: AnaEE
Contact: see specific information for each facility below

Services

Services include physical access to the infrastructure to perform on-site experiments.

Support offered

Both platforms have procedures in place to provide support to all external users, who will have access to the range of available laboratories, office space and instruments as well as lodging on site. Users will benefit from support provided by permanent staff to assist with technical advice and purchase of consumables, and the adaptation and further development of equipment and instruments based on agreements made before the beginning of an experiment. All external users will receive support in terms of planning of activities before and after arrival as well as hands-on training by the local scientific and technical staff.

Modality of access

Users have autonomous access to all experimental facilities and a dedicated schedule based on their project request and the availability of the platform. Costs are calculated daily based on unit cost (tank/day) including (1) number of days of use of animal breeding facilities, (2) number of days of use of outdoor mesocosms and (3) requests for instruments and support laboratory space. Mesocosms will be costed as actual costs. A large number of mesocosms-month will be allocated to external users through TA with access to laboratory and instruments. Efforts will be made to accommodate all kinds of independent experiments that could rely on the mesocosms offered. Access is offered to at least 6 people for 30 days each year.

2.12.1 Aquatic Metatron (CNRS-METATRON)

Location: Moulis (France)
Website: https://www.anaee-france.fr/en/infrastructure-services/enclosed-experimentation/aquatic-metatron
Contact: Murielle Richard (murielle.richard@sete.cnrs.fr), Simon Blanchet (simon.blanchet@sete.cnrs.fr)

The AQUATIC METATRON hosts (1) a lentic platform with 144 basins that can be connected to each other to allow for the dispersal of aquatic organisms and with a capacity to simulate temperature variation accurately and independently, and (2) a lotic platform with 12 artificial rivers. Outdoor mesocosms are equipped with a range of sensors and can be monitored with a range of mobile and laboratory instruments. Breeding rooms are available to host laboratory populations of small invertebrates (e.g. gammarids) and small freshwater fish species including non-model organisms (e.g., minnows, mosquitofish etc.).

2.12.2 CNRS - PLANAQUA

Location: Saint-Pierre-lès-Nemours (France)
Website: https://www.anaee-france.fr/en/infrastructure-services/enclosed-experimentation/planaqua/
Contact: Jean-François Le Galliard (cereep@bio.ens.psl.eu), Beatriz Decencière (beatriz.decenciere@bio.ens.psl.eu)

PLANAQUA includes a range of >80 outdoor mesocosms of various sizes (1-15 m^3) and shapes. Among those, 12 mesocosms (15 m^3 each) have wave generators to control water turbulence and 14 have a powerful warming system to control water temperature.

2.13 Institute of Marine Biology, Biotechnology and Aquaculture (HCMR-IMBBC)

The Institute of Marine Biology, Biotechnology and Aquaculture (HCMR-IMBBC) / Hellenic Centre for Marine Research (HCMR), offers four installations: 1) Aquaculture experimental facilities (HCMR-AQUALABS), 2) Biodiversity and Genomics facilities and technological platforms (HCMR-BIOGEN), 3) Ecosystem access and sampling (HMCR-ECO), and 4) High-performance computing (HMCR-HPC) cluster "Zorbas".

Expertise: Aquaculture, Biotechnology, Genomics, Environment, Data
Related Infrastructures: EMBRC, ELIXIR, AQUAEXCEL
Location: Crete (Greece)
Website: imbbc.hcmr.gr
Contact: Stavros Chatzifotis (stavros@hcmr.gr), see also specific information for each facility below

Support offered

HCMR offers its installation to researchers, students and trainees to carry out high level research in accordance with AQUASERV objectives. The AQUASERV users will be provided access to the internet, a desk, and will be offered the possibility to work with the different groups of activities at the Institute. The users will benefit from the guidance of highly qualified HCMR scientists for the preparation of the stay and during laboratory analyses.

2.13.1 HCMR - AQUALABS

Contact: Stavros Chatzifotis (stavros@hcmr.gr)

The HCMR-AQUALABS installation enables multidisciplinary research on all stages of aquaculture production (broodstock, eggs, larvae, juveniles, grown-out fish and genetic breeding) of the most commonly cultured Mediterranean species like European sea bass (*D. labrax*), gilthead sea bream (*S. aurata*), meagre (*A. regius*) and greater amberjack (*S. dumerili*). It consists of

i) battery of tanks supplied with an automated feeding system (with video, DO and T sensors) – a nutrition unit of 44 indoor tanks (0.05, 0.2, 0.5 and 17 m^3), 6 outdoor tanks of 5 m^3, and 18

tanks suitable for the determination of nutrient digestibility coefficients for aquafeeds and feed ingredients,

ii) mesocosm tanks supplied with feed chain zone for *Artemia* and rotifer culture and photobioreactors,

iii) biochemical laboratory with GC, HPLC, HPTLC Dumas nitrogen analyser, calorimeter, microscopes and PCs for video and image analysis, iv) net-pen cage unit (Souda) for pilot production at sea.

Services

The HCMR-AQUALABS installation supports RDI for established and new aquaculture fish species and receives a constant flow of visitors for research and education purposes. The installation pursuits R&I in a) hatchery technology and larviculture (developmental biology, morphology and ethology), b) nutrient and energy requirements and optimization of feeding, use of alternative sources of nutrients, c) fish behaviour in relation to schooling, self-feeding, learning, sorting devices, welfare using automated systems, d) production management in cages during grow-out in relation to feeding, behaviour and management.

Bioresources available

European sea bass (*Dicentrarchus labrax*), Gilthead sea bream (*Sparus aurata*), Meagre (*Argyrosomus regius*), Greater amberjack (*Seriola dumerili*)

Modality of access

HCMR - Aqualabs. Modality of access is Unit cost: tank/week. A typical access consists of 12 units. Each unit of access is a batch 12x500-L tanks or 1 mesocosm 40,000-L tank or 6x 500-L hatchery tanks for one week and includes fish, personnel, use of other supporting equipment and consumables (e.g. industrial feed or live feed) for one week. A user group is expected to stay on average 2 weeks at the installation. For longer experiments the stay can be divided to cover the start and finish of experiments. Users can participate actively in the setting up and/or monitoring of the experiment development. Scientific and technical assistance will be provided as required. Depending on the nature of the research, and although the experiments may take longer, users may spend two weeks at our institution, either continuously or one week in the beginning and one week at the termination of experimentation. Remote access is also possible in which a user or user group instructs the installation on the experiments to be carried out.

2.13.2 HCMR - Ecosystem Access & Sampling

Contact: Thanos Dailianis (thanosd@hcmr.gr)

The Ecosystem Access & Sampling installation (HCMR-ECO) includes a fully equipped scientific scuba diving facility with highly trained scientific divers and an inflatable boat, as well as sampling equipment. It provides access to coastal ecosystems and biological resources of the oligotrophic and rich-in-biodiversity Eastern Mediterranean Sea (Cretan and Libyan Seas), including hard and soft bottom benthos, seagrass and algal meadows, sub-marine caves, and coralliferous formations.

Services

The HCMR-ECO installation offers access to the coastal biodiversity and ecosystems of the Eastern Mediterranean Sea and supports research in marine ecology and biodiversity, including sampling of organisms, data collection, photo/video documentation, sensor deployment and retrieval, and manipulative experiments. Bioresources available on demand.

Modality of access

HCMR-ECO. Modality of access is Unit cost: user-group/day. A typical access consists of 5 units of access. Access to ecosystems for experiments or to biological resources, is provided through the SCUBA diving facility with expert scientific divers. Users can also dive if they have the relevant qualifications.

2.13.3 HCMR - Genomics & Biodiversity

Contact: Costas Tsigenopoulos (tsigeno@hcmr.gr)

The Genomics & Biodiversity installation (HCMR-BIOGEN), with state-of-the art laboratories and platforms including a) DNA sequencing platform (capillary Sanger, MiSeq Illumina short-read, and long-read Oxford Nanopore), b) The bioimaging facility (micro-computed tomography scanner), c) structural and chemical analysis (UHPLC system coupled with a tandem mass spectrometry system MS/MS), and d) a coastal experimental installation unique in the Mediterranean (the “Underwater Biotechnological Park”).

Services

The HCMR-BIOGEN installation supports RDI in genetics including i) the development of molecular markers, construction of genetic maps for target species, selective breeding and QTL analysis, ii)

genomics, transcriptomics & gene expression analyses, iii) population genetics-genomics including stock structure of commercial fishes iv) microbial diversity & DNA meta-barcoding, iv) targeted structural and chemical analysis of biomolecules and metabolites from marine organisms, and v) taxonomic analysis & phylogeny.

Modality of access

HCMR-BIOGEN. Modality of access is Unit cost: user group/week. A typical access consists of 4 units. Users can have access to the laboratories and platform services (DNA sequencing, micro-CT scans, structural analysis of biomolecules, standard chemical and microbiological analysis of environmental samples, and taxonomy) with the support of trained technical and scientific personnel. Access to labs and services can be both in-person and remote.

2.13.4HCMR - High-performance Computing

Contact: Evangelos Pafilis (pafilis@hcmr.gr)

The high-performance computing cluster “Zorbas” (HCMR-HPC), of 400 cores and 5TB memory containing more than 200 bioinformatics packages and pipelines, covering several types of analysis (e.g., assembly, metagenomics, ddRAD analysis, and population genetics).

Services

The HCMR-HPC installation supports users so the latter can conduct research in assembling and analysing reference genomes of marine non-model organisms, in transcriptome analysis, in analysis of microbial diversity (metagenomics) as well as DNA metabarcoding.

Support offered

HCMR offers its installation to researchers, students and trainees to carry out high level research in accordance with AQUASERV objectives. The AQUASERV users will be provided access to the internet, a desk, and will be offered the possibility to work with the different groups of activities at the Institute. The users will benefit from the guidance of highly qualified HCMR scientists for the preparation of the stay and during laboratory analyses.

Modality of access

HCMR-HPC. Modality of access is Combined cost: core/hour. Access can be remote or local. A typical access consists of 5.000 units. Users will be assisted by dedicated personnel.

2.14 Hungarian University of Agriculture and Life Sciences (MATE)

The Institute of Aquaculture and Environmental Safety of the Hungarian University of Agriculture and Life Sciences (MATE) comprises six departments and the Research Centre for Fisheries and Aquaculture (HAKI). Aquaculture-related R&D activities in the institute are centering around the following topics:
· The development of innovative fish farming and reproduction technologies for species of commercial interest.
· Development of aquafeed recipes for freshwater species based on locally produced protein ingredients.
· Mapping the genetics and reproductive biology of existing and new commercial fishes using -omic techniques.
The Institute has an extensive educational portfolio across the entire range of higher education training (BSc, MSc, and PhD). It is active in professional adult education (specialized in-service training).

Expertise: Aquaculture (traditional, intensive, and combined technologies), Biotechnology (cell culture, omics), Environmental Safety
Related Infrastructures: AQUAEXCEL
Location: see each facility for specific information
Website: https://aquaculture.uni-mate.hu
Contact: Jelena Stanivuk (stanivuk.jelena@uni-mate.hu)

2.14.1MATE POND

Location: Szarvas (Hungary)
Contact: Jelena Stanivuk (stanivuk.jelena@uni-mate.hu)

MATE-POND is a versatile, large-scale outdoor earthen pond system designed for experimental purposes in semi-industrial conditions. The facility includes a range of pond sizes: 9 ponds of 3.500 m², 15 ponds of 1.700 m², and eight ponds of 500 m². In the largest ponds, we can offer the installation of cages in a variety of dimensions: 17 x 4 m, 42 x 4 m, 23 x 9 m, and 6 x 18 m. This flexible setup is ideal for researching a wide range of species, age classes, and study areas. Upon request, we can also provide broodstock for specific pond-based experiments, ensuring researchers have access to everything they need for successful trials.

Services

MATE POND is suitable for a wide range of outdoor experiments, including the applicability of feed additives; nutrient dynamics in pond ecosystems; integrated fish production systems (in-pond-cage and in-pond-tank systems); and nutrient remediation trials in wetlands.

Bioresources available

In the MATE POND facility, applicants will be able to select from fish species that are typical of our national aquaculture industry. More precisely, they will be able to select work with different lines of common carp (*Cyprinus carpio*), grass carp (*Ctenopharyngodon idella*), tench (*Tinca tinca*), pikeperch (*Sander lucioperca*), Largemouth Bass (*Micropterus salmoides*), sterlet (*Acipenser ruthenus*), American paddlefish (*Polyodon spathula*), Russian sturgeon (*Acipenser gueldenstaedtii*), Siberian sturgeon (*Acipenser baerii*), European catfish (*Silurus glanis*) and African catfish (*Clarias gariepinus*). The age for trials is supposed to be chosen from larval to juvenile and growing-out stages. On special request, breeders of Perciformes and cyprinids could be provided.

Support offered

Supporting staff in MATE POND installation is skilled in the technological solutions for propagation and rearing in almost all freshwater aquaculture species, offering a wide range of trials on larvae and juveniles in various fields (genetics, welfare, nutrition). We offer help in pond preparation (manuring, disinfection, filling, water quality management) and operation services (daily feeding, weekly water quality monitoring, biweekly sampling harvest, water level management, etc.). During the visit, the applicant will be provided with an office.

Modality of access

Potential users of MATE POND services are advised to communicate with us at least five months in advance before the desired date for the start of the outdoor trial. The Modality of access is based on unit costs. One unit of access includes pond use (1 ha area of pond for one week or 0.5 ha for two weeks, etc.), consumables for pond preparation/maintenance, and water quality monitoring. The typical duration of work in this facility is three months or one rearing season.

2.14.2MATE RAS

Location: Szarvas (Hungary)

Contact: Jelena Stanivuk (stanivuk.jelena@uni-mate.hu)

MATE-RAS is a recirculation aquaculture system (RAS) composed of five independent units: I) larviculture system for Perciformes and Cyprinids (12 × 250L cylindro-conical tanks and 12 × 2L egg incubation Zug jars); II) larviculture system for sturgeons and catfish (8x250L raceway type tanks, 6 × 8L egg incubation Zug jars); III) 18-tank juvenile system composed of three identical and separated systems (6 × 1 m^3 tanks) with independently managed temperature (15-25° C); IV) 27-tank complex system (27 × 2 m^3 tanks); V) quarantine system (3 × 5 m^3 raceway tanks suitable for seasonal and out-of-season reproduction trials).

Services

MATE RAS is suitable for trials on breeders, eggs, larvae, and juveniles in the majority of European fish species and African catfish. Support staff is skilled in the technological solutions for propagation, from broodstock management, handling, controlling light and temperature for fluctuating propagation seasons, hormonal induction, and in-vitro egg maturation. Also, MATE RAS offers a wide range of trial possibilities on larvae and juveniles in various fields (genetics, welfare, nutrition).

Bioresources available

In the MATE RAS installation, applicants will be able to select from next fish species: Different selective lines of common carp (*Cyprinus carpio*), grass carp (*Ctenopharyngodon idella*), tench (*Tinca tinca*), pikeperch (*Sander lucioperca*), Largemouth Bass (*Micropterus salmoides*), sterlet (*Acipenser ruthenus*), American paddlefish (*Polyodon spathula*), Russian sturgeon (*Acipenser gueldenstaedtii*), Siberian sturgeon (*Acipenser baerii*), European catfish (*Silurus glanis*) and African catfish (*Clarias gariepinus*). The development stage for trials is supposed to be chosen from larval to juvenile or growing out stages. On special request, breeders of Perciformes and cyprinids could be provided.

Support offered

Daily maintenance of the trial, monitoring and data collection

Modality of access

Potential users are advised to communicate with us at least six months before the planned trial initiation so we can offer our assistance and integrate the plan into our agenda. Likewise, the applicants

are advised to consider potential seasonality of requested bioresources (larva, fry). The Modality of access is based on unit costs. One unit of access includes tank use (1 system for one week), consumables, and water quality monitoring. Partial access to 18-tank juvenile and 27-tank complex systems is possible if TA needs are harmonised with trials overlapping.

2.14.3MATE NUTRI

Location: Kaposvár (Hungary)
Contact: Jelena Stanivuk (stanivuk.jelena@uni-mate.hu)

MATE NUTRI is a RAS installation for nutritional investigations that consists of i) a RAS with 30 × 250L tanks and ii) a larvae-rearing RAS with 6 × 260L cylindro-conical tanks and 9 × 120L raceways; suitable for both cool and warm water species. Labs for chemical analysis of feed and fish (proximate composition, fatty acid, amino acid) are available. The production of experimental scale extruded feed 25-30 kg/batch is possible with a single screw extruder (Abrazive, Hungary). MATE NUTRI is specialised in feeding trials and is suitable for benchmarking experiments and comparative testing of additives in feed recipes.

Services

MATE NUTRI is specialised on feeding trials, suitable for benchmarking experiments, comparative testing of additives in feed recipes. Scientific staff can provide support in the development of new feeds, novel feed additives and the analysis of their effects (i.e. physiological, economic, consumer reception).

Bioresources available

The system is adequate for warm water species, including common carp (*Cyprinus carpio*), African catfish (*Clarias gariepinus*), and Nile tilapia (*Oreochromis niloticus*), which species are available.

Support offered

Scientific staff can provide support in the development of new feeds, novel feed additives, and the analysis of their effects (i.e., physiological, economic, and consumer reception). MATE NUTRI offers daily maintenance of the trial, monitoring, and data collection.

Modality of access

Potential users are advised to communicate with us at least a month prior to the proposal writing so we could offer our assistance and integrate the plan into our agenda. The Modality of access is based on

unit costs. One unit of access includes tank use (1 system for 1 week), consumables required for daily maintenance (feeding, data collection, monitoring of water parameters), technical support and feed formulation. Partial access to larvae rearing systems is possible. The minimum duration of access is 2 and 6 weeks in the larvae rearing system and main rearing units, respectively.

2.14.4 MATE CBL

Location: Gödöllő (Hungary)
Contact: Jelena Stanivuk (stanivuk.jelena@uni-mate.hu)

MATE CBL is a Laboratory for Cell Biology equipped with state-of-the-art equipment for Cell Biology and Cell Culture work - laminar flow hoods, incubators with and without CO^2 control with the additional option to control both CO^2 and O^2 concentrations through a ProOx C21 CO^2/O^2 controller and a C-Chamber, fluorescent inverted microscope and smaller instruments, including microinjection for cell transplantation (e.g., germline stem cells). MATE CBL is suitable for completion of most Cell Culture/Cell Biology experiments with primary focus on Reproductive Biology and Toxicology. The lab offers the possibility to conduct 2D, 3D or tissue cultures of various types, however, the exact type and form of culture needs to be discussed before the initiation of the experiment. Experiments can also be conducted on primary cell cultures or cell lines.

Services

MATE CBL is suitable for completion of most Cell Culture/Cell Biology experiments with primary focus on Reproductive Biology and Toxicology. The lab offers the possibility to conduct 2D, 3D or tissue cultures of various types, however, the exact type and form of culture needs to be discussed before the initiation of the experiment. Experiments can also be conducted on primary cell cultures or cells lines.

Bioresources available

Available bioresources include zebrafish (*Danio rerio*) adults, larvae, embryos, gametes as well as cell lines. In addition, a broodstock of common carp (*Cyprinus carpio*) and African catfish (*Clarias gariepinus*) is available as cell donors.

Support offered

Daily supervision and maintenance of the trial, however, the users are supposed to be present for the work.

Modality of access

Potential users are advised to communicate with us at least a month prior to the proposal writing so we can offer our assistance and integrate the plan into our agenda. The typical duration for trials in MATE CBL is between 4 and 6 weeks.

2.14.5 MATE DANIO

Location: Keszthely (Hungary)
Contact: Jelena Stanivuk (stanivuk.jelena@uni-mate.hu)

MATE Danio-Lab is an Aquaneering zebrafish facility with configurable tank numbers and volumes (20 × 1.4L or 12 × 2.5L or 6 × 6 L = 1 full shelf x 2, even in combination). Equipment for breeding, hatching, and rearing is available (modelling and mass production). Analysis and imaging of fish with stereo microscopes and cameras are also available. The lab is equipped with a fluorescent microscope adapter, including a GFP detection spectrum accompanied by a high-quality camera. Additional services: digital imaging – stereo microscope level.

Services

Experiments adapted to model and mass production are possible with the available lines (pairwise breeding, survival success, heat treatment/stress factors, feeding trials, etc.

Bioresources available

MATE Danio-Lab meets the international standards of zebrafish housing possessing the following lines: AB wild type; Casper; tg {vas::egfp}. Several brooders or 2-6 batches of embryos per week are provided upon request.

Support offered

MATE Danio-lab: Routine maintenance (e.g., feeding, system cleaning, etc.). An initial one-day demonstration on system use will be carried out. One part-time staff member will be assigned to support the experimental work, including crossing the fish.

Modality of access

For MATE Danio-Lab installation, access is provided 'on-site,' and the user is expected to stay the entire duration of the access. Potential users are advised to communicate with us at least a month prior to the

proposal writing so we can offer our assistance and integrate the plan into our agenda. A typical trial period for MATE Danio-lab installations is 10-13 weeks. One shelf is the equivalent of 20 × 1.4L tanks, 12 × 2.8L tanks, or 6 × 6L tanks. Breeding, hatching, rearing, and analysing hours must be synchronized with the department's ongoing experimental demands.

2.14.6 MATE GENO

Location: Keszthely (Hungary)
Contact: Jelena Stanivuk (stanivuk.jelena@uni-mate.hu)

MATE GENO-LAB offers access to equipment to perform comprehensive fish-related molecular works. Connected to MATE GENO-LAB, it is possible to collect real-time fish-related samples and process them with a modern genomic approach.

Services

DNA-RNA isolation; cDNA preparation; quality check; library preparation; real-time PCR; genotyping; Sanger and nanopore sequencing. MATE GENO-LAB is a genomics laboratory equipped with sequencers, PCR real-time PCR, etc.

Bioresources available

Wide sampling possibilities of native and non-native freshwater fish species. Prior consultation is required.

Support offered

Following an initial one-day demonstration on proper equipment use, users are supposed to work alone. This installation cannot offer continuous full-time support from staff.

Modality of access

MATE GENO-LAB access is provided 'on-site,' and the user is expected to stay the entire duration of the access. Potential users are advised to communicate with us at least a month prior to the proposal writing so we can offer our assistance and integrate the plan into our agenda. The typical duration of work in this facility is 10-13 weeks. The access to the equipment is maximized at an average of 4 hours/day.

2.15 University of Naples Federico II - Department of Agricultural Sciences (UNINA)

The Department of Agricultural Sciences at University of Naples Federico II is located at the historical Palace of Portici nestled at the foothill of Mt. Vesuvius. The department aims to deliver solutions to all agriculture and food-based challenges ranging from farm to fork with dedicated scientific and empirical research and sustainable technologies. The department houses the FASQ (Food Authenticity, Safety and Quality) infrastructure with three major installations: 1. Infrared spectroscopy laboratory, 2. Laboratory for Multielement Analysis (LAM), 3. Stable Isotope laboratory. The FASQ has successfully completed national and EU projects on quality and traceability of high value food products such as PGI lemons, PDO tomatoes, PDO asparagus and PDO pistachio, south Italian potatoes and Mediterranean seafood. FASQ laboratories have also analysed non-food samples (soil, mosses, plant materials etc.) for European projects (e.g. METROFOOD-EU, EU-LIFE ECOREMED, H2020 LANDSUPPORT, etc.) for their successful fulfillment. FASQ laboratories have also provided external services to institutes from Spain (CNTA, San Adrian), Tunisia (INSTM, Tunisia) and Canada (UQAT, Université du Québec, Canada) for building reliable and robust food traceability and quality models.

Expertise: Food , Feed, Environment, Data
Related Infrastructures: METROFOOD
Location: Naples (Italy)
Website: www.agraria.unina.it
Contact: Paola Adamo (paola.adamo@unina.it), Nidhi Dalal (nidhi.dalal@unina.it)

The FASQ infrastructure incorporates three analytical laboratories: 1. Infrared spectroscopy laboratory including advanced Perkin Elmer FT-IR with NIRA (Near Infrared Reflectance Accessory), 2. LAM including Thermo Fisher ICP-MS/ICP-OES/TQ-ICP-MS, 3. Stable isotope laboratory including Thermo Fisher IRMS. NIR spectral analysis performed on FT-IR can give in-depth composition of both solid and liquid food/feed samples with high accuracy. All quantitative and qualitative information is recorded in a detailed spectra with high resolution. ICP systems with OES and MS detectors can give detailed geochemical information about 43 nutritional, toxic & potentially toxic elements. TQ-ICP-MS in addition provides composition of rare-earths, trace and ultra-trace elements, instrumental for food/feed safety, food traceability, and water & soil quality. Levels and speciation of toxic elements like arsenic can also be quantified with TQ-ICP coupled with liquid chromatography. IRMS applied for estimation of stable isotope can successfully estimate δ13C and δ15N values with high degree of accuracy, and is an integral

tool for seafood & feed quality and soil analysis. The laboratory also hosts a CHNS analyzer separately (without IRMS) which can give accurate levels of carbon, hydrogen, nitrogen, and sulphur in the food matrix. We also have dedicated personnel to handle the instruments and the laboratory comes equipped with instruments needed for general pre-processing of food samples (lyophiliser, pulveriser, cold storage, etc.) and for mineral digestion. Apart from analytical expertise about running the instruments, our team provides experienced input about the experimental set-up (defined by the requirements and information provided by the user), method standardization for all analytical measurements, data cleaning, data processing and chemometric interpretation of results using traditional univariate and multivariate techniques.

Services

The FASQ laboratories at UNINA offer a comprehensive study of food composition, quality, and traceability aided by NIR spectra, geochemical composition, and stable isotope ratios. These are the three of the most established, cost efficient and reliable methods of food traceability for seafood with possibility for being applied in the market. Depending on the needs of the user, one or more methods can be applied to determine fish (seafood), feed and water quality. The lab is also equipped with instruments needed for general pre-processing of food samples, such as lyophiliser, pulveriser, cold storage, etc., and a microwave mineral digestor for ICP analysis.

Support offered

FASQ laboratory has more than 10 years of experience in food traceability and quality. The user can take advantage of the human capital at our research group for designing the experiment, defining the sampling methodology (it's a crucial part of any food authenticity/traceability study) and standardization of methodology for NIR, ICP and IRMS, depending on the sample type, size, and the need of the user. Our group is also proficient in handling the large amounts of data that comes with traceability and authenticity study. Additional support can be provided in data cleaning, pre-treatment, univariate analysis, and multivariate & regression modelling using traditional statistical software, as per user requirement.

Modality of access

FASQ will provide trans-national (physical) access to its services for direct analysis of food samples at the laboratory by the users. For trans-national access, the user will be trained and guided by the laboratory technician at FASQ. Remote access is also possible for users willing to ship samples in appropriate conditions. A user is expected to spend 5-7 weeks at FASQ depending on the sample

pretreatment, technique(s) and the number of samples. Access will also include sample pre-treatment (if needed), experimental design, method standardization, actual estimation, and data analysis.

2.16 University of Turin - Department of Agricultural, Forest and Food Sciences (UNITO)

The Department of Agricultural, Forest and Food Sciences (DISAFA) performs research to deliver knowledge and innovation, and provide evidence-based sustainable solutions to current and future challenges. DISAFA has a strong experience on animal husbandry and animal nutrition as well as on product quality. In particular, in the fish nutrition sector, DISAFA researchers have a particular experience on the use of alternative protein sources (insect, poultry by-products and vegetable meals) and lipid sources in aquafeed and their effects on growth, digestibility, product quality, intestinal health, microbiota and metabolic responses of freshwater fish species. Other expertise are related to the methods of fish slaughtering as well the effect of stocking densities on welfare of fish reared under organic aquaculture rules. DISAFA offers two installations:

1. Experimental farm for freshwater fish nutrition (UNITO-AQUA)
2. Experimental facility for insect trials (UNITO-INSECTS)

Expertise: Aquaculture
Related Infrastructures: AQUAEXCEL
Location: Turin (Italy)
Website: en.disafa.unito.it
Contact: Laura Gasco (laura.gasco@unito.it), Ilaria Biasato (ilaria.biasato@unito.it)

Support offered

Access includes scientific advice on experimental design, use of tanks (including fish supply and daily maintenance) and/or insect rooms, routine sampling and biometric measurements, conservation of samples, and access to an office with internet communication. The trials are performed under the supervision of a scientific staff and implemented by skilled technical staff. Scientific support will include advice on experimental design and methodology, and documentation of results for all the experiments conducted in the project.

2.16.1 UNITO Experimental farm for freshwater fish nutrition (UNITO-AQUA)

UNITO – AQUA is the experimental farm for freshwater fish nutrition, mainly dedicated to rainbow trout (*Oncorhynchus mykiss*), can also be rear sturgeons – *Acipenser baerii, A. trasmontanus, A. gueldenstaedtii*. It is a flow-through open system of 12 × 3000L indoor, and 24 × 100L and 24 × 400L outdoor tanks, the water supplied from artesian well (constant 13 ± 1 °C). A digestibility system is composed of 2 series of 6 × 240L flow-through open system of cylinder-conical tanks with automatic feces collector. The UNITO – AQUA allows experimental trials on all the stages of the trout lifecycle, and growth trials using sturgeons. The facility hosts research teams working on farmed salmonids providing scientific support to visiting scientists. A laboratory equipped with a vacuum machine, a bench colorimeter, a portable pH meter, a refrigerated chamber and -80°C freezer for sampling and storage of chilled and frozen samples is available to perform shelf-life trials. Research laboratories are also available at DISAFA (Grugliasco – about 25 km from the experimental infrastructure) with analytical equipment for nutrition related work: proximate, chemical and mineral composition, HPLC, GC, histology and microbiome analyses, flesh quality parameters (texture, TPA and cooking losses) and sensory analyses using untrained panellists and results can be coupled with results of electronic nose.

Services

Experimental trials on all the stages of the trout lifecycle, and growth trials using sturgeons can be performed at UNITO–AQUA. The facility has research teams working on farmed salmonids that provide scientific support to visiting scientists. A laboratory equipped with a vacuum machine, a bench colorimeter, a portable pH meter, a refrigerated chamber and -80°C freezer for sampling and storage of chilled and frozen samples are available to perform shelf-life trials. Research laboratories are also available at DISAFA (Grugliasco – about 25 km from the experimental infrastructure) with analytical equipment for nutrition related work: proximate, chemical and mineral composition, HPLC, GC, histology and microbiome analyses, flesh quality parameters (texture, TPA and cooking losses) and sensory analyses using untrained panellists and results can be coupled with results of electronic nose.

Bioresources available

Juvenile and adult rainbow trout (*Oncorhynchus mykiss*).

Modality of access

UNITO–AQUA unit of access is unit cost: tank/week. A typical access consists of 144 units of access (12 tanks for 12 weeks). Cold pellet fish feeds (not extruded) can be produced at the UNITO–AQUA (specific raw material should be provided by the user), while extruded feeds have to be provided by the user. Each user group is expected to stay for 10 days on average: 5 days at the beginning of the experiment to finalize the technical protocol details and start the experiment, and 5 days at the end of the experiment for final measurements and sampling. Access includes the use of tanks and the trial follow-up (daily feeding and husbandry of fish manipulation, and sampling of fish). A total of 2 projects/year (288 units of access) is estimated.

2.16.2 UNITO Experimental facility for insect trials (UNITO-INSECTS)

UNITO–INSECTS is an experimental facility for insect trials. It consists of two separate sectors: one for the black soldier fly (BSF, *Hermetia illucens*) and one for the yellow mealworm (YMW, *Tenebrio molitor*). It has 6 independent climatic rooms with controlled environmental conditions (light, T°, RH): (i) BSF reproduction room (4 × 4m), where the adult colony is maintained, and egg production performed. (ii) Hatching and weaning climatic chamber (2 × 1 × 2.5 m), where BSF eggs hatch and the first 5-6 days of insect larvae growth is performed. (iii) Room (3 × 4 m) dedicated to the YMW. (iv) Two rooms (3 × 4 m) usually dedicated to BSF larvae growth trials (5-6 days-old to the final larva stage) and to obtain insect meal and oil (BSF and YMW). (v) Room (2.9 × 6.5 × 2.9 m) to grow the larvae (BSF and YMW).

Services

UNITO–INSECTS is a unique experimental facility able to conduct trials using different organic substrates (by-products) to rear both *Hermetia illucens* and *Tenebrio molitor*, which are two of the most promising species for aquaculture feeds. Small-scale feeding trials on insect larvae will be performed and the best by-product-based diet will be used to perform a larval mass rearing. The larvae will be then processed by external insect companies to obtain a protein-rich meal. The obtained insect meal will be assessed for its digestibility and its potential to be included in diets for fish.

Bioresources available

Hermetia illucens (black soldier fly) and *Tenebrio molitor* (yellow mealworm), in all life stages (eggs, larvae, pupae and adults).

Modality of access

UNITO–INSECTS: Unit of access is unit cost: rearing box/week. A typical access consists of 32 units of access (16 rearing boxes for 2 weeks), the average length of a full growth trial with BSF larvae, or about 10 days for a growth trial with YMW, typically 5 at the beginning and 5 days at the end of the experiment for final measurements and sampling.

2.17 Stazione Zoologica Anton Dohrn (SZN)

SZN is dedicated to research in marine biological sciences, comprising the Department of Eco-sustainable Marine Biotechnology (BIOTECH) and the scientific service units of the Department of Research Infrastructure for Research (RIMAR). Research integrates state-of-the-art technologies, including "Omics" into marine biological systems to explore the diversity and functioning of marine organisms and whole ecosystems, with a strong focus on their applications in blue biotechnologies. SZN provides access to diverse Mediterranean ecosystems including extreme ones. Model taxa include protists (including microalgae), echinoderms, cephalopods, ascidians and vertebrates (including fish), and their various parasites. SZN core facilities comprise a) production of marine biological resources; b) molecular biology, sequencing and bioinformatics; c) taxonomy of marine organisms; d) microscopes and bioimaging; e) Field sampling, scientific diving, and research vessels; f) in extreme marine habitats; g) monitoring the quality of the marine environment and educational training.

Expertise: Biotechnology, Environment, Data,
Related Infrastructures: EMBRC, ELIXIR
Location: Naples (Italy)
Website: szn.it
Contact: Pasquale De Luca (pasquale.deluca@szn.it)

Services

SZN can provide access to: i) BlueBioprospecting service, that provides metabolically unique organisms and collections that have vast and undocumented molecular diversity and may provide leads for the current and future infectious disease challenges, and screening capabilities for developing and testing alternative antimicrobials and antiviral targeted towards the most important emerging fish pathogens, and vaccine adjuvants (e.g., complex polysaccharides of marine origin), ii) MOTAX service, that is an advanced unit for the isolation, culturing and taxonomical identification of various groups of marine organisms (specialization in: phytoplankton, zooplankton, Macrozoobenthos), integrating traditional morphological approaches and modern technologies such as electron microscopy and molecular barcoding, an integrated approach that can be applied to specific and scarcely tested fish feeds. More than 80 users were hosted by SZN during the previous TA project, ASSEMBLE+, requesting access to technology platforms and their integrated services and expertise; local service staff have developed high flexibility, adapting platforms to many users' needs.

Bioresources available

- Microorganisms collection, more than 400 bacterial strains, encompassing 40 genus.
- The complete list of bacteria is available upon request (pasquale.deluca@szn.it)
- Access to extreme environments

Support offered

The Local Liaison officer arranges access as agreed upon in the user-access contract. Service staff provides required training in platform use if needed and assists with troubleshooting. Other amenities include in-house or nearby cafeterias. No lodging is provided as hotels and restaurants are nearby. The Local Liaison assists with logistics and hotel reservations. Users are invited to attend weekly seminars and to present one to foster contacts.

Modality of access

Typical access is 30 days on-site. The user will have access to laboratories (including consumables and bench fee), preparatory work, specific training courses, state-of-the-art experimental facilities and technological platforms, ecosystems, and a wide variety of marine biological resources, subsistence and shipping of project materials from the EMBRC-IT to home institution.

2.18 Wageningen University (WR)

The infrastructure includes independent units for research on fish performance, all suited for short and long term experiments with new or established species in late-larval, juvenile or grow-out phase; 1) experimental set-ups for swimming of fish (four Blazka-type swim-tunnels, one Loligo swim-tunnel, a smaller and larger swim-carousel) with respirometry methodology and high speed cameras for analyses of swimming behaviour, 2) high throughput image based phenotyper with real-time computer vision analysis and selection, 3) acknowledged expertise in the assessment of methods to render food fish and experimental fish unconscious, using EEG and ECG registrations in combination with behaviour for assessment, 4) a number of independent RAS, with various options on the number and size of the tanks, depending on the proposition of the user. All systems are temperature controlled and suitable for fresh water and seawater and equipped with mechanical and bio-filtration units. Filter modules can be exchanged to meet the specific needs of the end-user, such as UV-disinfection, ozone treatment, up-flow filtration, de-nitrification etc. The facilities offer the ability to test in identical and independent RAS at system level effects of nutritional factors, environmental (water quality) factors, and management factors on system and fish performance. The swimming set-ups (tunnels) are tools to study fish exercise physiology and behaviour, to determine the impact of sensor tags or loggers (heart rate, acceleration, etc) and validate their outputs in relation to speed, oxygen consumption and swimming behaviour, or to determine impact of diet, climate change, water quality, etc. Fish can be tested individually, or batch wise for fitness traits that relate to genetic origin, metabolic traits and resilience. Stunning fish prior to killing contributes to the well-being of fish and thus to social acceptance of aquaculture.

Expertise: Aquaculture, Data
Related Infrastructures: AQUAEXCEL
Location: Wageningen (Netherlands)
Website: Wageningen Livestock Research: https://is.gd/8efi8U; Wageningen Aquaculture, Research & Education: https://is.gd/K71sNU
Contact: Wout Abbink (wout.abbink@wur.nl)

Services

The systems are suitable for both fresh and seawater, and fish in different stages of development (fingerlings, juvenile, grow-out) can be studied in short- and long-term studies. WR staff will advise on the experimental set-up, in close collaboration with the user. This includes system preparation, fish transport and acclimatisation. In addition, when appropriate, legal permits to work with experimental

animals will have to be obtained by a certified WR scientist prior to the experiment. During the actual experiment, WR staff will continue to support the user, including daily care, sampling and (temporal) storage of samples, and with data analysis and publication.

Support offered

The user will be supported by the technical and supporting staff, and a responsible scientist will be appointed as first contact person. The support will ensure that the regulations of WR and ethical regulations for animal experiments are followed, and that the experimental design, the work protocol, the actual experiment, and data acquisition will meet WR criteria. In addition, staff will assist in finding accommodation. TA users will get access to the relevant E-infrastructure, scientific literature, and databases of WR and laboratories.

Modality of access

On average each user or user group is expected to stay 30-60 days at the infrastructure. The user will be involved (depending on experience) in building up the specific system requirements to be used. The user will have the daily responsibility of the experiment, and coordination of the sampling and data analyses.

2.19 Institute of Marine Research (IMR)

The Institute of Marine Research studies everything from the seafood we eat to the most subtle details of marine ecosystems. We also invest a lot of resources in aquaculture research and developing new technology. Our vessels, laboratories and research stations collect the data that inform our research and scientific advice.

Expertise: Aquaculture, Environment
Related Infrastructures: EMBRC, AQUAEXCEL
Website: www.hi.no/en
Contact: Prescilla Perrichon (prescilla.perrichon@hi.no), see also specific contact for each facility

Support offered

Experienced technical assistance will carry out the standard procedures and the general maintenance. Specialist technical support for daily experimental work and sampling can be provided to all visiting scientists (on-demand access and additional personnel costs might be applied). In case of absence during the experimental period, the experiment will be supported by the IMR station technicians in close contact with the user. IMR greatly supports scientific cooperation and research network.

Modality of access

The cost model is unit cost and the unit of access is defined as one tank/week. The access time and unit at IMR-ARS is strongly dependent on the research planned objectives and the targeted-species and -life stages. A typical project is 3 months for one person focusing fish early life stages, 1-2 months (9 to 12 tanks) for the first-feeding stages and 1- to several months for juvenile/young adults stages experiment (12 to 15 tanks), depending on the research objectives. The research activities at IMR are season- and species-dependent, therefore supply of different life stages are also season-dependent. The applicants will coordinate with the liaison officer whether the facilities are appropriate, available for the planned research and determine the most suitable time for the visit depending on other demands of the facilities and technical assistance. Support with accommodation will be provided. The applicant will be welcomed by the liaison officer and be integrated to a scientific research group related to the subject of the project to facilitate the applicant integration and scientific support. To facilitate the development of cooperation and scientific network between the applicant and host, the applicant will be encouraged to communicate and disseminate their research and participate in the Institute ongoing program. During the visit, the applicant will have access to the office facilities, IT service and scientific library.

2.19.1IMR - Austevoll Research Station

Location: Austevoll (Norway)

Contact: Prescilla Perrichon (prescilla.perrichon@hi.no), Kjetil Stensland (kjetil.stensland@hi.no)

IMR-ARS is one of Europe's largest and most advanced research facilities. In keeping with species seasonality, complete life cycles (from embryo to adult stages) are produced for numerous marine fish species. The facilities have been approved for more than 150+ species of economic and ecological interest. IMR-ARS will make available the EMBRC facilities, holding a unique and stable broodstock of Atlantic halibut, European plaice and Atlantic cod. The broodstock facility comprises three 8 m diameter tanks (50,000 L) and three 5 m diameter tanks with constant temperature (6-9°C) and flow through open system. Three experimental buildings are offered to the applicant. The hatchery has sixteen circular 250 L incubators (for halibut embryos in season), nine silos (cylindro-conical tanks) of 8000 L for larval nursing and twelve cylindro-conical 70 L tanks used for embryos and larval incubators for other fish species. Twelve first-feeding tanks of 1500 L and eighteen 500 L tanks are also available. Two racks of twelve circular 50 L tanks are also available for larger experimental design. Silo systems have previously been used and adapted for cultures of Calanus copepods, so the system may be available for other research purposes than larval incubation. Live feed departments (*Artemia* and natural zooplankton) are also provided to fit the feed requirements of the fish early stages. A new sea facility consists of 16 cages, a separate floating quay and a feeding facility. The feeding system is specially designed for IMR to be able to carry out experiments, also on feeding in small and large units. Everything is controlled digitally. The experimental facilities and the biological resources available at IMR are excellent for performing experiments in the following research areas: Establishing new fish species for sustainable aquaculture; Optimization of aquaculture technology; Life history traits and fish development and transitions; Hatchery technology and larviculture; Life environmental requirements, Fish nutritional requirement (feed, feeding and digestive physiology); Optimization of feeding and alternative feed sources; Welfare indicators for fish; Disease in farmed and wild fish; Fish behavioural studies; Fish developmental physiology; Fish reproductive physiology; Transcriptomics and bioinformatics. Additional laboratories are available for environmental and anthropogenic impact research aspects (recirculation lab (e.g. crude oil exposure), low trophic lab (e.g. heavy metals, PFAS, mining exposure) and Arctic lab for research related to extreme cold water species/Arctic species. IMR has internationally recognized scientists which will be involved in networking and research activities. This will provide a great supportive and stimulating environment for the applicant.

Services

The experimental facilities and the biological resources available at IMR are excellent for performing experiments in the following research areas: Establishing new fish species for sustainable aquaculture; Optimization of aquaculture technology; Life history traits and fish development and transitions; Hatchery technology and larviculture; Life environmental requirements, Fish nutritional requirement (feed, feeding and digestive physiology); Optimization of feeding and alternative feed sources; Welfare indicators for fish; Disease in farmed and wild fish; Fish behavioral studies; Fish developmental physiology; Fish reproductive physiology; Transcriptomics and bioinformatics. IMR has internationally recognized scientists which will be involved in networking and research activities. This will provide a great supportive and stimulating environment for the applicant.

Bioresources available

Stem Algae Culture (on-site service):

- Access to cultures of *Dunaliella pluvialis, Tetraselmis suecica, Tetraselmis* sp., *Rhodomonas baltica, Isochrysis galbana, Pavlova lutheri, Chaetoceros muelleri, Chaetoceros pumilus, Skeletonema costatum* and *Isochrysis* sp.

Species collected upon request (on-site service): Regulation approved more than 150 species (all life stages) to work at IMR. Given its coastal location, it offers access to important marine ecosystems of our Norwegian fjords, coastal and offshore waters.

- Access to deep-sea species (e.g. deep-sea corals, bivalves) and coastal species of plankton, fish (e.g. European plaice (*Pleuronectes platessa*), European flounder (*Platichthys flesus),* Lemon sole *(Microstomus kitt),* Lesser sandeel *(Ammodytes marinus),* cleaner fish (wrasse (*Labrus bergylta)*, lumpfish (Cyclopterus lumpus)), crustaceans (European lobsters (*Homarus gammarus*)), bivalves (e.g. blue mussels (*Mytilus edulis)*, cockles (*Acanthocardia echinata)*, scallops (*Pecten maximus*), polychaetes (e.g. *Capitella* sp.).

Live feeding department (on-site service): rotifers, *Artemia sp., Arcatia sp.* (upon request) and access to a natural production pond of copepods (Svartasjen pond of IMR).

Marine model organisms (on-site service and remote access/delivery for eggs stage):

- Broodstock of Atlantic halibut (*Hippoglossus hippoglossus*), European plaice (*Pleuronectes platessa*) from wild and cultured, Atlantic cod (*Gadus morhua*) and Atlantic haddock (*Melanogrammus æglefinus*).

- In season, lesser sandeel (*Ammodytes marinus*) production from wild catch spawners. Unique production of lesser sandeel (from egg to juvenile stages).
- Atlantic salmon (*Salmo salar*) and rainbow trout (*Oncorhynchus mykiss*) can be used for experiments in sea cages upon request.

2.19.2IMR - Matre Research Station

Location: Matre (Norway)

Contact: Prescilla Perrichon (prescilla.perrichon@hi.no), Eric Dahl-Paulsen (Erik.Dahl-Paulsen@hi.no)

At IMR-MRS, 80 tanks with 100 cm diameter equipped with waste feed collectors and video cameras are available. IMR-MRS has a main focus on cultured and wild stocks of salmonids like Atlantic salmon from several Norwegian rivers and cultured rainbow trout. The experimental facilities and the biological resources available at IMR are excellent for performing experiments in the following research areas: Establishing new fish species for sustainable aquaculture; Optimization of aquaculture technology; Life history traits and fish development and transitions; Hatchery technology and larviculture; Life environmental requirements, Fish nutritional requirement (feed, feeding and digestive physiology); Optimization of feeding and alternative feed sources; Welfare indicators for fish; Disease in farmed and wild fish; Fish behavioral studies; Fish developmental physiology; Fish reproductive physiology; Transcriptomics and bioinformatics. IMR has internationally recognized scientists which will be involved in networking and research activities. This will provide a great supportive and stimulating environment for the applicant.

Services

The experimental facilities and the biological resources available at IMR are excellent for performing experiments in the following research areas: Establishing new fish species for sustainable aquaculture; optimization of aquaculture technology; life history traits and fish development and transitions; hatchery technology and larviculture; life environmental requirements, fish nutritional requirement (feed, feeding and digestive physiology); optimization of feeding and alternative feed sources; welfare indicators for fish; disease in farmed and wild fish; fish behavioural studies; fish developmental physiology; fish reproductive physiology; transcriptomics and bioinformatics. IMR has internationally recognized scientists which will be involved in networking and research activities. This will provide a great supportive and stimulating environment for the applicant.

Bioresources available

Species collected upon requested (On-site service):

- Diverse fish, crustaceans, bivalve's species from Masfjorden area.

Marine model organisms (On-site service):

- A range of aquaculture fish species, Atlantic salmon (*Salmo salar*), Rainbow trout (*Oncorhynchus mykiss*). The facilities have been used also to establish models for early sexual maturation in salmon which are combined with genotyped fish lines (isogenic and outbred) and CRISPR based genome editing in functional studies.

2.20 University of Bergen (UIB)

The University of Bergen (UiB) has a strong focus on marine sciences, ideally situated on the Atlantic coast for research into marine ecosystems. UiB's multidisciplinary approach involves experts from the humanities, medicine, and social sciences, focusing on key areas such as: Marine and fisheries biology, Climate change impacts and Sustainable oil and gas exploration. The close collaboration between UiB and industry, particularly in aquaculture, has contributed to Norway's central position in sustainable aquaculture production, demonstrating the success of academic-industry partnership.
The Department of Biological sciences at the University of Bergen (UiB) is responsible for the Marine Biological Station at Espeland (MBSE). The Station is located at the fjord, Raunefjord, 20 km south of downtown Bergen (and the main campus of UiB) and close to the airport, Flesland, about 3 kilometers or 15 minutes away.

Expertise: Fisheries, Environment
Related Infrastructures: EMBRC
Location: Bergen (Norway)
Website: https://is.gd/Hh6xsk
Contact: Henrik Glenner (henrik.glenner@uib.no), Rannveig Myklebust (rannveig.myklebust@uib.no)

Espegrend Marine Biological Station: The fjord systems around Espeland are considered as a Scandinavian biodiversity hot-spot and the MBSE provide easy access to highly diverse and well-described marine habitats and model environments in the fjords. The station comprises a boat, equipment house, several open smaller motorboats, a larger research vessel (20 feet) and all basic equipment for marine field research. The Infrastructure on land includes multiple laboratories (chemistry lab, isotope minilab for ^{14}C and ^{3}H, live lab, formalin lab, 3 walk-in cold rooms with running seawater and light control, general lab equipment such as freezers and ovens, Milli-Q water, a cooled centrifuge, microscopes, etc.), a larger teaching lab and an auditorium, dormitories for up to 30 visitors, a large kitchen, and combined dining and living room. The University of Bergen Mesocosm Centre (UIB-MC) is part of MBSE. It offers a wide range of opportunities for marine mesocosm experiments. The facility includes a floating platform with 12 enclosures in the Raunefjord (10-30 m^3 each) plus 18 land-based outdoor mesocosms (2.5 m^3), both located at UIB's Marine Biological Station. A unique feature of the enclosures in the fjord is a floating raft that provides high-quality wet-lab space and electricity for immediate sample processing and lab-based measurements of samples. The mesocosm facility at MBSE

was initiated in 1978 and has since been continued with few interruptions. This makes the mesocosms facility at MBSE the longest existing in the world, entailing the longest experimental track record for mesocosm studies of pelagic ecosystems. Due to the short distances to all kinds of biotopes and thanks to the equipment on board the research vessels, it is easy to carry living animals' home to the aquaria at the marine station. Algae and deep-water animals can easily be collected and brought back to the laboratory alive, as many of them occur at quite shallow depths in the fjords and as the temperature of the surface water is low. Thus within 15 minutes of being collected, specimens can be transferred to aquaria where they can survive for months, permitting studies of even their larval development. The proximity (15 min) to a large international airport also gives MBSE unique opportunities both in terms of short-term collection visits and remote access activities. A particularly important feature is that researchers have an opportunity to verify experimental results in settings of increasing complexity, ranging from laboratory-based studies to well controlled outdoor mesocosms on land and enclosures in the fjord. In addition, experimental results can be compared with observational data from a wide range of natural pelagic environments, given that the Norwegian west coast is the only place in Europe with close access to both coastal and oceanic environments.

Bioresources available

At our facilities we have experience with working with many species of marine and freshwater fish, depending on the type of research and wishes of the TNA guest.

Support offered

Users will have access to mesocosms, laboratories and office space. Technical expertise/assistance will be provided both in connection with sampling activities and the use of the mesocosms facilities. Boarding at the station will be possible for shorter or longer periods. MBSE will also offer remote access options (collection, packing or dispatch). The possibility of collecting organisms from an extremely large diversity of marine habitats (deep sea, underwater mountains to intertidal areas) together with the proximity to an international airport will make remote access from MBSE an attractive activity. Scientific cooperation with UiB scientists will facilitate access to additional facilities (e.g., specialised state-of-the-art laboratories at the main campus in downtown Bergen, 20km away), instruments, and expertise of local staff.

Modality of access

The method used to declare access costs is unit cost (person/day). A minimum of 100 person/days are needed to conduct experiments using the mesocosms or other MBSE facilities or for successful field

sampling in the marine environment. To support increased international cooperation and foster adaptation of new approaches and techniques, individual users and smaller groups will be invited to apply for TA in support of projects at the MBSE facilities. Furthermore, to enhance scientific progress and output, efforts will be made to coordinate the TA activities with other ongoing and planned projects.

2.21 Norwegian University of Science and Technology (NTNU)

NTNU SeaLab provides a multidisciplinary platform for aquaculture and marine science research and education. It assembles researchers and students in the field of aquaculture biology and technology, fisheries, processing of marine resources, marine engineering, coastal community development and marine ecotoxicology. NTNUs special aquaculture competence is related to several biological aspects of fish, zooplankton, and micro-/macro-algae, open ocean cage systems, environmental impacts of aquaculture, land-based recycling systems (RAS), and hatchery technology and logistics. NTNU SeaLab offers nine flexible climate-controlled wet labs, as well as two larger climate-controlled wet labs for experiments with fish, all with access to freshwater and seawater, and a suite of analytical labs.

Expertise: Aquaculture, Biotechnology, Environment
Related Infrastructures: EMBRC, AQUAEXCEL
Location: Trondheim (Norway)
Website: https://www.ntnu.edu/sealab
Contact: Kjell Inge Reitan (kjell.i.reitan@ntnu.no), Inger Jennings (inger.m.jennings@ntnu.no)

Facilities include:

- CODTECH larviculture laboratory: An automated system consisting of 16 rearing tanks (100/200L) with optional self-cleaning. It is especially designed for controlled experiments with marine fish larvae and planktonic organisms, with associated infrastructure for production of live feed organisms (Rotifers, *Artemia* and copepods) and microalgae. The CODTECH laboratory is suitable for experiments on a wide range of freshwater and marine species. Environmental variables such as temperature and light are controlled electronically and monitored. There are automated systems for feeding live prey and formulated feed.
- Laboratory for trophic interactions: NTNU Sealab can offer access to facilities for performing experiments with model species of copepods (Calanus finmarchicus and Acartia tonsa) under controlled environmental conditions for observing the effects of temperature, carbon dioxide and chemical stressors - either individually or in combination. The National Center for PlanktonTechnology (Plankton lab) offers nine experimental laboratories (each 10 – 30 m^2) for plankton experiments (zooplankton and algae), and live prey cultivation.
- Micro– and macroalgae laboratories: The labs consist of cultivation units at different volumes (flasks, cylinders of 10-200 L), photobioreactors, and tanks designed for cultivation of macroalgae

seedlings. New infrastructure for next-generation cultivation of several macroalgae species for further deployment in the sea. The laboratories enable temperature control, control of light intensity and rhythm, nutrients, and salinity. The labs are equipped with instruments to register spore and gamete cell densities.

- Experimental Recirculation System (RAS): The Mini-RAS system consists of six independent recirculation systems each holding two tanks , for research and development of RAS systems and biofilters using fresh,brackish or seawater.
- Analytical laboratories (biochemistry and histology): The analytical laboratories are equipped with basic instrumentation, such as spectrophotometer and spectrofluorometer (both with optional temperature control and microplate reader), GC-MS for lipid analysis, a Coulter counter and an algae incubator. At the histology/morphology laboratory there are fluorescence and light microscopes with cameras and access to computer-assisted stereological software for making volumetric calculations from histological sections, as well as equipment for tissue embedding, sectioning, staining, and tissue analyses.

Services

NTNU SeaLab has participated in all three of the AQUAEXCEL projects and has hosted several experiments related to cultivation of fish larvae and micro-algae. There is great interest in working with the cultures of copepods, notably *Calanus finmarchicus*, which is made available to international users via EMBRC. The aquaculture research group at NTNU is cross-disciplinary and has expertise in marine biology and technology, control systems, physiology, and microbiology. The group has a long and broad experience in developing biological knowledge and technology for intensive larval rearing of cold-water species, with numerous national and international research projects, and major international involvement in R&D. In particular, there is high competence in innovating and improving start feeding techniques related to the cultivation of marine cold water and tropical fish larvae. During recent years, the facility has also contributed significantly to the development of methods for cultivation of continuous lines of copepods (e.g. *Acartia tonsa*). This organism is considered an important alternative larval feed sources in mariculture, as well as having a long record as model species for environmental and toxicological studies together with Calanus finmarchicus. NTNU has the infrastructure and experience to produce different types of live feed, depending on the species cultivated and the specific needs of the experiments: microalgae, rotifers, *Artemia* and copepods. These prey organisms can also be enriched in various ways, to provide fish larvae with requested nutritional contents according to experimental design.

Bioresources available

NTNU SeaLab offers an in-house culture of *Calanus finmarchicus*, a copepod with an important role in the marine food web. The species has a wide range of applications in research as a model organism for environmental and toxicological studies. One of the full-time technicians at SeaLab offers in-house expertise on rearing and conducting experiments with marine copepods. Additional species of marine copepods may be sourced for comparative studies.
Farmed and wild species of marine and anadromous fish may be sourced for experiments at SeaLab. The facility is also licensed for experiments with many species of molluscs, crustaceans and echinoderms.

NTNU SeaLab hosts the research group Taskforce salmon lice, which specialises in research on this commercially significant parasite in salmonids. The research group keeps permanent cultures of two species of sea lice, *Lepeophtheirus salmonis* and *Caligus elongatus*, which can be made available to users conducting research at SeaLab.

Support offered

Scientific support: The scientific staff involved in the running interdisciplinary research and education activities consists of professors, post-doctoral researchers and PhD-students from several departments and faculties. The presence of experts and broad knowledge in first feeding experiments and cultivation of planktonic organisms, fish physiology, larval development and nutrition, microbiology, functional genomics, biotechnology, marine cybernetics, robotics, control systems and ICT tools in intensive aquaculture systems, provides a stimulating research area for external researchers and students visiting the facilities at Sealab.

Technical support: Dedicated technical staff for operation of tanks, instruments, monitoring and sampling gear, adjustment of experimental systems, temperature, water quality, water exchange rate according to experimental design. The water delivery system is computer controlled, meaning parameters such as water flow, oxygen level and temperature are continuously monitored, and staff are on call 24/7 to respond if there is a problem. Supply of live prey organisms, microalgae, and laboratory assistance to perform standard analyses of samples is available on request and may incur additional cost depending on the workload.

Logistic support: All users will be offered desk space and will have access to the wireless communication area of NTNU. They can use technical workshops, digital meeting rooms and library services. The

university's Office of International Relations offers professional services to all guest researchers. Accommodation is available within the city of Trondheim, but university accommodation is not offered.

Modality of access

Access is provided on the basis of unit costs. A user or user group may stay up to three months at the infrastructure (max 90 days). Initial planning of the experiment will happen well in advance, either by email or video calls. Upon arrival, a user(group) will typically do preparatory work in the lab for about 1 week, or more depending on the project, before experiments are conducted. Analysis of samples may be done during or after the experimental period. Specific tools and instruments needed for individual measurements and analysis can be made available if within budget limits, depending on availability. Access includes, but is not necessarily limited to, advice on experimental design, choice of fish and plankton/live prey supply, purchase of commercial fish feed, maintenance of the infrastructure when needed and monitoring of control parameters, assistance with routine sampling and conservation of samples, provision of monitoring data and access to office space and internet. For analytical labs, assistance with sample preparation and processing of data will be available. In general user training will be provided when needed for the various tasks. Access also involves equipping the facility and making the necessary preparations before arrival. Any specific, experiment related components that are not readily available at SeaLab may need to be purchased by the users themselves. Additional technical assistance that is not included in the unit of access may be available on request and must be paid for by the user. The need for this will be clarified during planning meetings before the start of the access period.

2.22 Interdisciplinary Centre of Marine and Environmental Research (CIIMAR)

Location: Matosinhos (Portugal)
Website: www.ciimar.up.pt
Contact: Carla Domingues, Ana Cavadas (ciimarembrc@ciimar.up.pt)
Expertise: Aquaculture, Fisheries, Biotechnology, Environment, Data
Related Infrastructures: EMBRC

CIIMAR is a leading research and advanced training institution working on the frontier of knowledge and innovation. The centre uses knowledge-based approaches to promote the natural capital and the sustained management of marine resources through monitoring of ecosystems health, optimisation of aquaculture, and biotechnological exploitation of the resources for environmental and human health applications. CIIMAR brings together 380 researchers, of which 180 holding a PhD degree, covering an extensive diversity of scientific and technological skills and expertise. CIIMAR´s new state-of-the-art facilities for research, training and services are located at the heart of the maritime industry and services in the Northern region of Portugal (Leixões harbour).

Bioresources available

- **Culture collections** *(On-site service)*
  - LEGE culture collection (400 Cyanobacterial strains);
  - Access to cultures of Actinobacteria, Planctomycetes and bacteria from different phyla (Proteobacteria, Firmicutes and Bacteroidetes)
- **Species collected upon request** *(On-site service)*
  - Species from the Atlantic Western coast of Portugal and adjacent estuaries
- **Marine model organisms** *(On-site service)*
  - A range of aquaculture fish species, invertebrates, macroalgae and model organisms can be provided: e.g.: *Dicentrarchus labrax, Spaurus aurata, Diplodus sargos, Lipophrys pholis, Solea senegalensis, Psetta maxima, Anguilla anguilla, Cyprinus carpio, Salmo trutta fario, Onchorhynchus mykiss, Danio rerio, Torpedo marmorata, Scyliorhinus canicula, Paracentritus lividus, Gammarus locusta, Artemia salina, Laminaria ochroleuca, Laminaria hyperborea, Saccharina latissima, Saccorhiza polyschides*

Support offered

Technical and scientific support will be assigned to the visitors according to the specific objectives of the TA. Visitors will be provided their own office and lab space and they will have full independence and will receive required logistical (reception, integration into infrastructure through the Liaison Officer), technical (labs and platforms dedicated technical staff) or scientific support (if in-house expertise is required). Users carrying out procedures with live animals must hold an animal experimentation certificate and a licence from National authorities (DGAV) must be required in advance. Typical access consists in finalising the planning (generally initiated remotely), the setting up and the monitoring of experiments. Longer experiments may be set up by the service provider and the visit will be for monitoring and finalising experiments, preparation of storage or other materials, collection of samples for various purposes, storage in appropriate media. Some samples may need to be initially locally analysed in laboratories and platforms. Paperwork and shipment costs of special materials, reagents or equipment will be the responsibility of the users. Costs related to shipment of samples may be covered by the TA and will be evaluated on a case-by-case basis. The scientific atmosphere of the centre is international and informal. Regular seminars and conferences provide excellent opportunities for users to share and take part in ongoing research activities, expecting future collaborations. Pre-flight cancellation insurance and full health/work/travel insurance covering pre-existing medical conditions and including world-wide travel assistance and emergency air transportation services, are required covering the full period of access from departure to return. This is a private cost not covered by the TA.

2.22.1CIIMAR - Ecosystem access

Ecosystem access to intertidal and subtidal areas and estuarine ecosystems (access on foot, boat and scuba diving), buoys equipped with sensors for environmental monitoring, GPS equipped drifters, CTD and other means used to study coastal and estuarine dynamics, and associated time-series biological and environmental data. CIIMAR Scientific Diving Center is fully equipped to support research underwater with tools and equipment for observational surveys, manipulative experiments, biological and non-biological sample collection, and image collection.

2.22.2CIIMAR - Aquaculture

Aquaculture platform, fully dedicated to the experimentation and maintenance of a wide range of aquatic organisms (macro and microalgae, fish, cephalopods and other invertebrates) and includes state of the art recirculation aquaculture systems (RAS); systems for toxicology and infection studies with

specific effluent treatments; a zebrafish facility; hyperbaric chambers able to simulate from 0 to 1000 metres depth; and a phytoplankton culture facility.

2.22.3CIIMAR - Labs & Platforms

Laboratories and Platforms for Analytical Chemistry, Biodiscovery and Biorefinery, Bioinformatics, Culture Collections, Genomic and Proteomics and Ecotoxicology. Instrumentation available includes Real time PCR, DGGE, RT-QPCR, HPLC-instrumentation, LC-MS, GC-MS, Segmented Flow Analyzers, Atomic Absorption Spectrometers, Organic Elemental Analyzer-Isotope Ratio Mass Spectrometer, fluorescence, stereo and inverted microscopes, spectrophotometers, ultra-freezers. A HPC facility is available to support research in numerical ocean modelling, ecological modelling and bioinformatics. Access to collections of microalgae, cyanobacteria, planctomycetes and bacteria isolates from sponges is included.

Modality of access

Actual Costs will be the method used for CIIMAR Laboratories and Technological Platforms, CIIMAR Ecosystem Access Platform, CIIMAR Aquaculture and Animal Experimentation Platform. Unit of access: tank/week for aquarium, aquaculture and animal experimentation facilities, user/day for laboratories and platforms user-group.day for ecosystem access, boats, scientific dive and telemetry. Duration of work: Typically, one or two users stay for 20-30 days depending on the type of work. A typical project consists of approx. 48 units of access for aquaria facilities, 20 units of access of laboratories and platforms, 3 days for ecosystem access, boat, scientific dive support and telemetry.
Expected output/deliverables for users: Users will be able to carry out their projects according to pre-arranged planning and they can do at least some of the analysis in situ. If requested, users can benefit from interaction with a local group.
Users are expected to test new methodologies, obtain samples and data from different kinds of experiments, e.g., nutrition, growth and physiology, behaviour. Users are expected to provide a seminar and a report of the visit. Scientific papers, patents and/or other outputs are expected from the visit.

2.23 Coimbra Collection of Algae (ACOI)

ACOI is a scientific resource centre within the University of Coimbra that promotes interdisciplinary research linking biodiversity, fisheries, and blue biotechnology. It comprises a diverse team of experts with a range of skills and expertise in various fields of phycology and marine biology. It enables access to technological platforms with cutting edge equipment well supported by competent staff. Provides privileged access to a unique and one of the largest living microalgae and cyanobacteria culture collection.

Expertise: Fisheries, Phycology, Aquaculture, Biotechnology, Environment
Related Infrastructures: EMBRC
Location: Coimbra (Portugal)
Website: https://www.uc.pt/en/coimbra-collection-of-algae/
Contact: Mariana Assunção (mariana.assuncao@uc.pt)

Services

ACOI - Labs & Platforms

Laboratories and technological platforms for Molecular Biology, Analytical and Structural Chemistry, Imaging and Ecotoxicology, including access to cultivation-controlled systems and a collection of more than 4000 microalgae and cyanobacteria strains. Equipment available includes: DIC, optical microscopes coupled with digital photographic cameras, PCR instrumentation, GC-MS, GC-FID, GC-BID, HPLC-UV, LC-MS/MS, UHPLC-RI, UHPLC-DAD, and UHPLC-TOF-MS chromatographies, Proton (1H), Deuterium (2H) and Carbon-13 (13C) Nuclear Magnetic Resonance (500 and 600MHz, NMR), nutrient analyser, TDS. uHPLC-DAD and uHPLC-RI, GC-FID and GC-BID, spectrophotometers, freeze-dryers, molecular tools, structural and chemical analysis.

ACOI - Ecosystem access

Estuarine ecosystem access by the research vessel "Darwin I" to collect samples within Portuguese estuaries: 4.7m, 20hp engine. Allow basic work in oceanography and fishing.

Bioresources available

Culture collection (on-site and remote service)

- **ACOI Culture Collection** (http://acoi.ci.uc.pt) - 4000 strains of cyanobacteria and microalgae from Portuguese environments (marine, brackish, freshwater, soil and aerial)

Species collected upon request (on-site and remote service)

- Species from local marine and estuarine flora and fauna from the Mondego estuary (including saltmarshes, mudflats), adjacent coastal areas and estuaries in the Portuguese Atlantic coast.

Support offered

Technical and scientific support will be assigned to the visitors according to the specific objectives of the TA. Visitors will be provided their own office and lab space and they will have full independence and will receive required logistical (reception, integration into infrastructure through the Liaison Officer), technical (labs and platforms dedicated technical staff) or scientific support (if in-house expertise is required). Users carrying out procedures with live animals must hold an animal experimentation certificate and a license from National authorities (DGAV) must be required in advance. Typical access consists in finalizing the planning (generally initiated remotely), the setting up and the monitoring of experiments. Longer experiments may be set up by the service provider and the visit will be for monitoring and finalizing experiments, preparation of storage or other materials, collection of samples for various purposes, storage in appropriate media. Some samples may need to be initially locally analysed in laboratories and platforms. Paperwork and shipment costs of special materials, reagents or equipment will be the responsibility of the users. Costs related to shipment of samples may be covered by the TA and will be evaluated on a case-by-case basis. The scientific atmosphere of the centre is international and informal. Regular seminars and conferences provide excellent opportunities for users to share and take part in ongoing research activities, expecting future collaborations. Pre-flight cancellation insurance and full health/work/travel insurance covering pre-existing medical conditions and including world-wide travel assistance and emergency air transportation services, are required covering the full period of access from departure to return. This is a private cost not covered by the TA.

Modality of access

Access costs will be declared on the basis of Unit cost for ACOI Laboratories and Technological Platforms. Actual costs will be the method used for ACOI Ecosystem Access. Units of access: user/day for laboratories and platforms user-group/day for ecosystem access. Duration of work: Typically, one or two users stay for 20-30 days depending on the type of work. A typical project consists of approx. 20 units of access for laboratories and platforms and 3 units for ecosystem access.
Expected output/deliverables for users: Users will be able to carry out their projects according to pre-arranged planning and they can do at least some of the analysis in situ. If requested, users can benefit from interaction with a local group.

Users are expected to test new methodologies, obtain samples and data from different kinds of experiments, e.g., nutrition, growth and physiology, behaviour. Users are expected to provide a seminar and a report of the visit. Scientific papers, patents and/or other outputs are expected from the visit.

2.24 Algarve Centre of Marine Sciences (CCMAR)

CCMAR is a non-profit research organization located in the Gambelas Campus of the University of Algarve. The Ramalhete Marine Station is a facility dedicated to experimentation with marine organisms, including fish (seabass, seabream, sole), macroalgae, and bivalves. It is located in the Ria Formosa National Park, a unique coastal mesotidal lagoon, separated from the ocean by a system of barrier islands and inlets. It can offer tailored experimental setups with indoor/outdoor tanks of various sizes and controlled environment. A variety of experiments with larvae, and juveniles of several fish species such as nutrition, behavior, general and specific physiology including acidification can be performed. Research laboratories and technology platforms are located in the Gambelas Campus of the University of Algarve. A bioinformatics computational cluster offers software for genome assembly and transcriptomics studies. Complementary services include molecular biology (sequencing and proteomics) and analytical and structural chemistry. Transport between the Gambelas Campus and Ramalhete Marine Station is available during working days. The infrastructure receives approximately 100 external users per year. Approximately 15 projects are run on the station annually and more than 50 projects use the laboratories and platforms. Among recent scientific achievements, the development of sea cucumber aquaculture, the demonstration of fish olfactory impairment under ocean acidification conditions, sequenced genomes of sea bass, sea bream and sardine, development of novel fish feeds. Users carrying out procedures with live fish must hold a Felasa animal experimentation certification and a project license from the Directorate General for Food and Veterinary (DGAV) to be requested in advance.

Expertise: Aquaculture, Fisheries, Biotechnology, Environment, Data
Related Infrastructures: EMBRC, ELIXIR, AQUAEXCEL
Location: Faro (Portugal)
Website: www.ccmar.ualg.pt
Contact: Ana Amaral (ccmarassemble@ualg.pt)

A typical access consists of planning (generally initiated remotely), the setting up and the monitoring of experiments. Longer experiments may be setup by the service provider and the visit consists of monitoring and finalizing experiments, collection of samples, storage and preparation for transport. Some samples may be locally analyzed in the laboratories and technical platforms. Technical and scientific support will be assigned to the visitors according to the specific objectives of the TNA. Visitors will be provided their own desk and lab space. During their visit they will have full independence and

will receive, as required, logistical, technical or scientific support through the liaison officer and other staff. Local accommodation can be booked by CCMAR. Costs related to shipment of samples may be covered by the TA and will be evaluated on a case-by-case basis. Paperwork and shipment costs of special materials, reagents or equipment will be responsibility of the users. There is a weekly seminar program, complemented by visitor and invitation conferences. Visitors will be given access to the general services: administrative services, internet access, accommodation, documentation and communication, and access to laboratories. Pre-flight cancellation insurance and full health/work/travel insurance covering pre-existing medical conditions, world-wide travel assistance and emergency air transportation services covering the full period of access from departure to return are required. This is a private cost not covered by the TNA.

Services

Boats

Boats up to 12 m fully equipped for research in the coastal area, allowing basic work in oceanography, fishing, and acoustic telemetry and access to diverse ecosystems, some protected –intertidal rocky shores, lagoons, salt marshes, mudflats, saltpans, kelp forests or coral reefs, coastal and continental shelf (up to 30 miles), planktonic and pelagic communities.

Scientific diving

Scientific diving supported by a fully certified diving team for sample collection, underwater experimentation, underwater video and photography. Available equipment includes computers, diving equipment, underwater scooter, 6.5m boat with dual engines 90HP (180HP) prepared for diving with multi beam sonar, two vans (5 sets + 9 sets).

Ramalhete marine station

Ramalhete Marine Station (flow through) and LEOA (closed circuit) and a semi-industrial photobioreactor park can provide tanks for tailored experimental designs for aquatic production systems. Different size indoor and outdoor tanks, isolated rooms for studies that require environmental or behavioural control, wet and dry laboratories are available. The facilities are used mostly for projects related to fish (seabass, seabream, sole), macroalgae, seagrasses, hard corals, zebrafish, seahorses, sea urchin, crabs and cultured microalgae.

The Ramalhete Experimental Station offers access to projects requiring tanks of different capacities: 100 L (n=24); 500 L (n=20); 1000 L (n=22); 3000 L (3); 9000 L (5). Tanks are set flow-through supplied with filtered natural sea water. Indoor and outdoor systems of tanks are setup for CO2 experiments simulating

oceanic acidification scenarios. Tanks and space can be adapted to fulfill specific experimental needs as temperature control, photoperiod, light intensity, or salinity. Species available include sole (Sole senegalensis), seabream (Sparus aurata) and seabass (Dicentrachus labrax).

Platforms

Platforms equipped with state-of-the-art equipment for chemical and structural analyses (chromatography and Mass Spectrometry, Nuclear Magnetic Resonance, Spectrophotometry, Elemental Analysis, Sample Processing); bioimaging (widefield and lightsheet microscopes) supports a variety of bioimaging modalities, including fluorescence, brightfield and contrast-enhancement techniques, applied to the study of specimens in 3D from the micro to the mesoscale, both live and fixed; biological assays and conduct advanced research in molecular biology and Omics; ProtMar, a marine protein pipeline that brings the necessary expertise and equipment for small and medium scale production and purification from a diversity of marine sourced biomass or recombinant production.
CCMAR laboratories and platforms (Gambelas Campus) are well equipped with state-of-the-art instruments (mass spectrometry, nuclear magnetic resonance, confocal and light-sheet microscopy, electrophysiology, cell culture) for biological research at all levels, from biochemistry to molecular biology, bioinformatics, nutrition, physiology, behaviour and ecology. The CCMAR laboratories and platforms offer access to technology platforms and support services: molecular biology (incl. sequencing and proteomics), analytical chemistry (mass spectrometry coupled to gas chromatography and HPLC, nuclear magnetic resonance spectrometry), imaging (fluorescence confocal and light sheet microscopy), cell culture and bioinformatics (CETA computational infrastructure).

Telemetry

Telemetry supported by a permanent network of acoustic receivers - 10 acoustic receivers spread along the Algarve coast (from the Guadiana Estuary to Portimão), and an array in the Arrábida Marine Park and nearby areas, including the Sado estuary, consisting of >40 receivers with areas with overlapping ranges.

Support offered

Technical and scientific support will be assigned to the visitors according to the specific objectives of the TA. Visitors will be provided their own office and lab space and they will have full independence and will receive required logistical (reception, integration into infrastructure through the Liaison Officer), technical (labs and platforms dedicated technical staff) or scientific support (if in-house expertise is required). Users carrying out procedures with live animals must hold an animal experimentation certificate and a license from National authorities (DGAV) must be required in advance. Typical access

consists in finalizing the planning (generally initiated remotely), the setting up and the monitoring of experiments. Longer experiments may be set up by the service provider and the visit will be for monitoring and finalizing experiments, preparation of storage or other materials, collection of samples for various purposes, storage in appropriate media. Some samples may need to be initially locally analysed in laboratories and platforms. Paperwork and shipment costs of special materials, reagents or equipment will be the responsibility of the users. Costs related to shipment of samples may be covered by the TA and will be evaluated on a case-by-case basis. The scientific atmosphere of the centre is international and informal. Regular seminars and conferences provide excellent opportunities for users to share and take part on ongoing research activities, expecting future collaborations. Pre-flight cancellation insurance and full health/work/travel insurance covering pre-existing medical conditions and including world-wide travel assistance and emergency air transportation services, are required covering the full period of access from departure to return. This is a private cost not covered by the TA.

Modality of access

A user group will have access to the services offered under this TNA: 1) access to experimental facilities - tanks and supporting laboratories – and organisms (fish, molluscs and macroalgae) at Ramalhete (CCMAR, Faro). Users carrying out procedures with live animals must hold a Felasa animal experimentation certification and a project license from the Directorate General for Food and Veterinary (DGAV) to be requested in advance. Support will be provided in the first instance through the Liaison Officer who will take care of introduction to local rules and permits needed, ensure integration of visitors and projects into the scheduling of the infrastructure, and will help with access to facilities. Users will be able to carry out their projects according to pre-arranged planning and they can do at least some of the analysis in situ. As a rule, user access the facilities with complete independence from local research groups. Only if requested, users can benefit from interaction with a local group to benefit from their expertise. Users are expected to provide a seminar and a report of the visit. Paperwork and shipment costs of special materials, reagents or equipment will be the responsibility of the users. Costs related to shipment of samples may be covered to some extent and will be evaluated on a one-by-one basis. Pre-flight cancellation insurance and full health/work/travel insurance covering pre-existing medical conditions, and including world-wide travel assistance and emergency air transportation services, are required covering the full period of access from departure to return. This is a private cost not covered by CCMAR. Access typically consists in finalizing the planning (generally initiated remotely), the setting up and the monitoring of experiments. Longer experiments may be setup by service provider and the visit will be for monitoring and finalizing experiments, preparation of storage or other materials, collection of samples for various purposes, storage in appropriate media. Some samples may need to be

initially locally analysed in laboratories and platforms. Technical and scientific support will be assigned to the visitors according to the specific objectives of the TA. Costs are declared by a combination of units of access and actual costs. The unit of access at Ramalhete Marine Station, is defined as tank/week (e.g. 20 units of access are 20 tanks during one week or 10 tanks during two weeks).

2.25 Instituto Nacional de Saúde Doutor Ricardo Jorge (INSA)

The Department of Food and Nutrition (DAN) of the National Institute of Health Doutor Ricardo Jorge (INSA) develops activities in the areas of food safety, toxicology and risk assessment, food composition, food and nutrition, lifestyles and impact on health through research and development, surveillance, reference, provision of differentiated services, training, information and consultancy. Among its responsibilities are the promotion, coordination and carrying out of research and development in food and nutrition, identifying needs and establishing the respective priorities following national and international strategies, namely those established by the Ministry of Health, which reinforce the national programs and internationalization. DAN also acts as a reference laboratory for health in the areas of food safety and nutrition by implementing new methodologies, conducting the laboratory epidemiological study of food-borne illnesses, providing differentiated services, including analytical tests, and organizing external laboratory quality assessment programs.

Expertise: Biotechnology, Food / Social
Related Infrastructures: METROFOOD
Location: Lisbon (Portugal)
Website: https://www.insa.min-saude.pt/
Contact: Inês Coelho (ines.coelho@insa.min-saude.pt), Inês Delgado (ines.delgado@insa.min-saude.pt)

INSA provides complete food and feed characterisation services regarding its nutritional composition and microbiological and chemical contaminants. The services offered evaluate the nutritional value and safety of raw materials or food as consumed and include the development of secure and sustainable packages for fish products.

Services

Food and Nutrition (FN)

The Station for nutritional characterisation includes highly advanced Mass Spectrometry equipment and liquid chromatography with several detectors (LC-MS/MS-PAD-FLR) available for protein and vitamin characterisation. These types of equipment are used to identify and determine the levels of fat-soluble vitamins, all complex B vitamins, amino acids and antioxidants in food and feed.
An ICP-MS and an ICP-OES are also available for elemental determination, allowing for micro, trace and ultra-trace elemental analysis.

Additionally, at the station, the following parameters can be determined: fat, fatty acids, carbohydrates, proteins, amino acids, water content, and soluble and insoluble dietary fibres. A digestion model for assessing the bioaccessibility of the different nutrients is also available.
Most of the FN station's analytical services are accredited for food analysis by ISO 17025.

Food Safety and Toxicology (FST)
The FST station includes laboratories for chemical and microbiological analysis of food and feed products.
Microbiological laboratories are equipped to identify pathogenic and non-pathogenic bacteria and fungal species.
Chemical laboratories are equipped with LC-MS/MS, GC-FID, and ICP-MS to analyse mycotoxins, biogenic amines, acrylamide, and inorganic and environmental contaminants such as arsenic, lead, cadmium, and PFAS.
Global migration tests are performed to characterise food-contact materials and food packaging.
A dedicated cell culture laboratory for toxicity analysis of compounds in several cell models is available.
Most of the FST station's analytical services are accredited for food analysis by ISO 17025.

Support offered

The INSA scientific staff will accompany and support the users and provide scientific and technical expertise, thus helping to accomplish their study objectives and deliver results within the agreed timeline. Users will receive lab space and necessary access to buildings and facilities.

Modality of access

The access modality can be on-site (TA access) or remote access.
TA users will access the facilities and perform the experiments themselves under the guidance of the INSA scientific staff. Access can be, for example, a 5-day visit, which includes setting up experiments, sample pre-treatment, analytical measurements, data processing, and results analysis. However, the duration of the TA and other specific details will be agreed with the users for each request.
In remote access, users can ship their samples to the laboratory for analysis. For each request, the users will agree on specific details, such as the number of samples and shipping date.

2.26 Instituto Português do Mar e da Atmosfera (IPMA)

METROFOOD-RI at INSA and IPMA aims at promoting scientific excellence in the field of food quality and safety. It provides high-quality metrology services in food and nutrition. Owing to their high interdisciplinary INSA and IPMA laboratories cooperate on metrology services in food and nutrition throughout the food value chain, including agrifood, sustainable development, food safety, quality, and human health.

Expertise: Aquaculture, Fisheries, Environment
Related Infrastructures: METROFOOD
Location: Lisbon (Portugal)
Website: https://www.ipma.pt
Contact: Narcisa Bandarra (narcisa@ipma.pt), Helena Lourenço (helena@ipma.pt)

IPMA - DivAV laboratory infrastructure has dedicated facilities rooms for: (i) sample preparation and analytical processing; (ii) analysis of lipids in feeds and seafood (namely, HPTLC for lipid class analysis, GC-FID for fatty acid profile determination, and in vitro digestion model for lipid bioaccessibility); (iii) performance of freshness analysis in seafood through biochemical characterisation supported by LC-MS; and (iv) a sensory analysis laboratory with separate cabins and controlled conditions. DivAV has conducted studies on the effects of feed formulation and slaughtering method on seafood quality with special emphasis on lipid fraction, lipid oxidation, and freshness overall of fish.

Services

DivAv offers services on feed composition (with special focus on the lipid fraction), freshness indices (with special attention to oxidation levels and other biochemical parameters), and overall lipid composition aspects in fish (lipid classes, fatty acid profile, bioaccessibility of lipid components, etc.) and receives typically 1-2 international visitors annually.

Support offered

The research teams will support the users and provide scientific and technical expertise, thus helping to accomplish their study objectives and deliver results within the previously agreed timeline.

Modality of access

The Modality of access is preferably on site based on actual costs. A typical access will be 20-30 days. Users will be integrated into the scheduling of the laboratory, including training and preparatory work, experimental set-up, testing and analysis, result analysis meetings, and final reporting.

2.27 Jožef Stefan Institut (JSI)

Jožef Stefan Institute (JSI) is the leading Slovenian scientific research institute covering a wide range of basic and applied research. More than 1.000 employees specialise in natural sciences, life sciences and engineering.

Expertise: Biotechnology, Food / Social, Data
Related Infrastructures: METROFOOD
Location: Ljubljana (Slovenia)
Website: http://environment.si
Contact: Nives Ogrinc (nives.ogrinc@ijs.si), Vanja Usenik (vanja.usenik@ijs.si)

The infrastructure comprises a mass spectrometry center offering several analytical possibilities using the following equipment: mass spectrometers: UPLC-qTOF-MS/MS, ICP-MS, ICP-MS QQQ, LA-ICP-MS, LC-ICP-MS, GC-ICP-MS, SP-ICP-MS, GC(IT)MS, GC-MSD, LC-MS/MS; isotope ratio mass spectrometry: EA-IRMS, GC-C-IRMS, DI-IRMS, Py-IRMS, MC ICP-MS; nuclear methods: TRIGA MARK II nuclear reactor, alpha, beta and gamma counting; Mercury analysis and speciation: Cold vapour atomic absorption spectrometry (CV AAS, detector Milton Roy, Model 1255, two systems); Cold vapour atomic fluorescence spectrometry (CV AFS, detector Tekran, model 2500) with double amalgamation system and Hg vapour calibration system; Cold vapour atomic fluorescence spectrometry (CV AFS, two systems with Brooks Rand detectors); Direct Mercury Analyzer (DMA 80 – Milestone Microwave Laboratory Systems). Establishment of appropriate models and verification tools. The infrastructure offers analysis of biomarkers for quality, safety, authenticity, and traceability (QSAT-Analysis) with applications to the authenticity and traceability of food based on stable isotope approach, elemental composition and other analysis (fatty acids, VOCs, amino acids). The approach could be used to verify authenticity of food products (wild vs. aquaculture, organic vs. conventional), geographical and botanical origin determination; safety of food products in relation to elemental analysis specifically toxic elements such as Pb, Cd, Hg and Hg speciation (inorganic, organic – MeHg) and stable isotopes of Hg to determine the sources of Hg, Se speciation. Organic contaminants such as new emerging contaminants (CEC, PAH, pesticides, ...) using target, suspect, non-target analysis.

Services

The infrastructure offers analysis of biomarkers for quality, safety, authenticity, and traceability (QSAT-Analysis) with applications to the authenticity and traceability of food based on stable isotope approach,

elemental composition and other analysis (fatty acids, VOCs, amino acids). The approach could be used to verify authenticity of food products (wild vs. aquaculture, organic vs. conventional), geographical and botanical origin determination; safety of food products in relation to elemental analysis specifically toxic elements such as Pb, Cd, Hg and Hg speciation (inorganic, organic – MeHg) and stable isotopes of Hg to determine the sources of Hg, Se speciation. Organic contaminants such as new emerging contaminants (CEC, PAH, pesticides, ...) using target, suspect, non-target analysis. Currently the RI is involved in four EU projects with fish and seafood quality, safety and traceability and algae as alternative food sources from which three of them we are coordinating (FishEUTrust, FoodTraNet, GMOS-Train) and MERFISH. It provides training of researchers, students and ESRs from different EU and international countries. Examples of studies include: - Development and enable 10 newly developed food matrix reference materials USGS82 to USGS91 to the stable isotope community to adhere more closely to established guidelines and recommended practices when measuring stable isotope ratios of food and other materials. - Verification of the geographical origin of selected fruits and vegetables and establishment of the database of authentic Slovenian honey in collaboration with the Administration of the Republic of Slovenia for Food Safety, Veterinary and Plant Protection (2018-2022).

Support offered

Users have access to facilities, internet and technical and scientific support. Logistic support to find accommodation or other amenities is also provided.

Modality of access

Access can be both on-site and remote, based on actual costs. Users will be able to carry out the work by themselves but technical and scientific support is available. They can also ship samples for analysis. The access includes experimental set-up, to be defined according to the specific information provided by the users, organization, sample pre-treatment and analytical measurements, data processing and elaboration results. Typically, the provision of a service requires 1-2 weeks per access, but it can vary according to the type and number of samples.

2.28 Consejo Superior de Investigaciones Científicas (CSIC)

The infrastructure offered by CSIC are located in the campus of the Instituto de Acuicultura de Torre de la Sal (IATS) in Castellón and in Ribera de Cabanes, Castellón (IEO-ICAR-MAP), Spain. IATS offers the use of experimental tanks (EXP) and the use of analytical labs (ANA). The users will be able to develop a research project using highly qualified facilities and having access to a research environment which has proven to be highly productive in the previous AQUAEXCEL and AQUAEXCEL2020 projects. Users will have the opportunity to consult, have advice and interchange ideas with experts on most of the disciplines in Aquaculture, with notable excellence in marine fish parasites, fish pathology, fish immunology, nutrigenomics, genomics, biochemistry, cellular and molecular biology to study and control fish reproduction, food intake and growth, *Artemia,* and fish larviculture.

Expertise: Aquaculture, Fisheries, Biotechnology, Environment, Data
Related Infrastructures: AQUAEXCEL
Website: see specific information for each facility
Location: see specific information for each facility
Contact: see specific information for each facility

Support offered

Users will receive access to all necessary equipment, live animals and consumables to complete their research project, as agreed in their access proposal. Use of tanks will include maintenance, water supply, daily feeding, husbandry, manipulation and sampling of fish. Users will be provided with any necessary technical assistance, training and advice on methodologies, experimental design and data analysis. In addition, users will be trained by highly qualified and experienced technical and scientific personnel on methodologies, experimental design and data analysis. The access will include assessment by technical and scientific personnel and will depend on the type of project. Remote assistance for in silico and meta-analysis is also envisaged. Users will have the opportunity to consult, have advice and interchange ideas with scientific staff with expertise on most of the disciplines in Aquaculture, with notable excellence in marine fish nutrition and pathology, larviculture and nutritional enrichment of live preys, *Artemia* biology, fish immunology and biochemistry, and cellular and molecular biology to study and control fish reproduction, food intake and growth from early life stages to completion of production cycles. Thus, users will have the opportunity of learning how to run a project under the best experimental conditions and to apply this knowledge to their own infrastructures back to their countries. Access to equipment and consumables will be as agreed in the access proposal. Access to

transcriptomic and genomic databases will also be provided when agreed. During the stage at infrastructures, users will have access to the full text journals and databases. This will imply a quick and efficient way of acquiring bibliographic information, and more opportunities to discuss the information available and to produce high quality scientific publications. Users will be integrated in a research group and expected to collaborate in all the research process including report and article writing and publishing. The visiting scientist will receive support for finding accommodation.

Modality of access

The Modality of access is unit.cost and the unit of access are defined as person/weeks - the number of weeks each person in a project is using a set of analytical laboratories for the analyses of samples (IATS-ANA) or a set of experimental tanks and associated lab units (IATS-EXP and IEO-ICAR-MAP). For IATS-ANA a typical access consists of 4 units of access, for IATS-EXP it will be 12 units of access, and for IEO-ICAR-MAP it will consist of 8 units. CSIC infrastructures will carry out experiments and provide physical access to its facilities during crucial periods of the running experiments. The typical stay for IATS-ANA users are 4 weeks, and for IATS-EXP and IEO-ICAR-MAP each user or user group is expected to stay 2 weeks at the infrastructure distributed at the convenience of the user (typically at the beginning of the experiment to finalize the technical protocol details and start the experiment and at the end of the experiment for final measurements and sampling).

2.28.1 CSIC - IATS-ANA

Location: Ribera de Cabanes, Castellón (Spain)
Website: www.iats.csic.es
Contact: Josep Calduch-Giner (j.calduch@csic.es)

IATS-ANA includes associated services and 9 analytical laboratories located in Institute of Aquaculture Torre de la Sal (IATS). They have all the scientific appliances and devices to conduct most of the techniques and analyses involved in research in aquaculture: microscopy, histology, histochemistry, ISH, immunoassays, gas and liquid chromatography, PCR and RT-PCR and other molecular techniques for gene expression analysis, epigenetic mapping, in vitro cell and eukaryotic culture, isotopic assays, micromanipulation, and monitoring of microbiota as a welfare indicator by sequencing with minION and Illumina platforms. IATS-ANA methodologies are applied in the fields of: genetic marker analysis of molluscs and fish, fish health and welfare, fish nutrition and growth, marine larviculture, ecotoxicology,

fish reproduction, neuroendocrinology and energy metabolism, biotechnology, and environmental and organism monitoring.

Services

IATS-ANA methodologies are applied in the fields of: genetic marker analysis of molluscs and fish, fish health and welfare, fish nutrition and growth, marine larviculture, ecotoxicology, fish reproduction, neuroendocrinology and energy metabolism, biotechnology, and environmental and organism monitoring.

2.28.2 CSIC - IEO-ICAR-MAP

Location: Puerto de Mazarrón, Murcia (Spain)
Website: www.icar.ieo.es
Contact: Aurelio Ortega García (aurelio.ortega@ieo.csic.es)

IEO-ICAR-MAP consists of two marine aquaculture facilities located in the Region of Murcia devoted to culture Mediterranean species, mainly Atlantic bluefin tuna (ABFT) but also another Mediterranean species like sea bass, sea bream, yellowtail and another Scombrids and Scienidae. (1) The facility for controlling the reproduction of the bluefin tuna has 2 broodstock tanks (20-22m Ø and 9-10 m depth -2,600 and 3,500 m3-) containing 50 ABFT brood fish and 2 juvenile tanks (14 m Ø, 6 m depth -900 m3 - and and 8 m Ø, 3 m depth -150 m3-). Juvenile tanks are devoted to the quarantine, adaptation and ongrowing of fish. (2) The marine aquaculture plant comprises facilities for reproduction, incubation, larval rearing, weaning and ongrowing marine fish species. It includes more than 200 culture units, between 150 l and 100 m3 each, with a total volume of 1,300 m3. It provides automatic systems for controlling biological and physic-chemical parameters, as well as monitoring and control systems for feeding, nutrition and fish behavior by means of self-feeders and video cameras. IEO-ICAR-MAP is aimed to develop techniques for juvenile production of bluefin tuna, as well as breeding and juvenile production of other Mediterranean fish species. Main services are related to tuna farming, species diversification, nutrition and food, recirculation systems (RAS) and AMTI development, animal health, welfare and OWIs, live prey and larval rearing, physiology and behavior studies and formation and training of technicians on bluefin tuna rearing.

Services

IEO-ICAR-MAP is aimed to develop techniques for juvenile production of bluefin tuna, as well as breeding and juvenile production of other Mediterranean fish species. Main services are related to tuna farming, species diversification, nutrition and food, recirculation systems (RAS) and AMTI development, animal health, welfare and OWIs, live prey and larval rearing, physiology and behavior studies and formation and training of technicians on bluefin tuna rearing.

2.28.3 CSIC-IATS-EXP

Location: Ribera de Cabanes, Castellón (Spain)
Website: www.iats.csic.es
Contact: Josep Calduch-Giner (j.calduch@csic.es)

IATS-EXP comprises about 250 research holding tanks with different shapes and capacities (from 3000 l to 30 l) located in different units at IATS, with a total surface of 2100 m^2, and the associated wet labs and sampling rooms. The open sea flow provides 90,000 m^3/h and water temperature ranges naturally from 11 to 28 ˚C. Tanks with recirculation and heat/cooling systems are available in some units. Water quality (salinity, temperature, filtration, etc.) and light conditions (photoperiod, intensity, etc.) vary depending on the type of projects and specific tanks in use.

Services

IATS-EXP installations are adequate for conducting experiments in most of the disciplines involved in aquaculture research: Health and welfare (parasite and bacterial challenges), physiology and energy metabolism (hypoxia priming and pre-conditioning, swimming exercise tests), reproduction, nutrition and growth, live prey and larval rearing. Biosensor technology, based on the use of AEFishBIT datalogger developed in AQUAEXCEL2020, is also available for individual and poorly invasive monitoring of respiratory frequency and jerk acceleration in juvenile and adult fish. Experimental studies can be conducted with a great variety of species: gilthead sea bream, European sea bass, sole, turbot, mussel, clam and *Artemia*, with access to one of the largest *Artemia* cysts collection available in Europe.

2.29 Marine Science & Technology Park (ULPGC)

The Marine Science & Technology Park (PCTM) is a European Excellence Aquaculture Complex (RI). It includes all culture phases (reproduction, larvae, juvenile) for different marine species (fish and molluscs), tanks and cages, and recirculation systems. It is composed of eight specialized wet labs, three offered for Transnational Access: 1. Warm Water Species Selection Unit, 2. Marine Bio-Assays Station, 3. Feed Ingredients and Additives Testing Unit. These facilities have a monitoring system (MIRANDA) to control water flow, temperature, oxygen (including an emergency system), photoperiod, feeders and surveillance cameras with remote access. It is a singular European RI included in MERIL because of the Semi-intensive Experimental Production Plant (PPPA) and the Biofactory of Natural Marine Products (AFPP). The PCTM is supported by University of Las Palmas de Gran Canaria, through the Aquaculture Research Groupwhich has several dry labs (Biochemistry and Chromatography, Marine Genetics, Histology and Health, Quality, Bacteriology and Virology). In these three installations, biosensor technology, based on the use of the FishBIT datalogger developed in AQUAEXCEL2020 is also available for individual monitoring of physical activity and respiratory frequency in juveniles and adult seabream and seabass, depending on availability.

Expertise: Aquaculture
Related Infrastructures: AQUAEXCEL
Location: see specific information for each facility
Website: https://www.ecoaqua.eu/
Contact: see specific information for each facility

Support offered

PCTM has logistic organization in terms of administration, technician for automatisms and fish and molluscs rearing, postdoctoral and senior researchers in Genetics, Nutrition, Pathology, Stress, Fish and Meat quality, and new species. The trials would be developed under a scientific environment of quality and interactive, and participation in workshops or seminars during the visits.

Modality of access

The method used to declare access costs is unit cost. The unit of access is tank/week for the three installations. A typical access for user or user group to stay for 10 days corresponding to 139 units of access for WWSSU, 99 units of access for MBS and 144 units of access for FITU. The unit of access includes in addition to the use of tanks, preparatory training according to species, technique, culture system.

Expected output/deliverables for users: High quality data, interactions with local researchers (harmonization of procedures, standardization of traits), possible collaborative research.

Bioresources available

- Fish: gilthead sea bream (*Sparus aurata*), European sea bass (*Dicentrarchus labrax*), greater amberjack (*Seriola dumerili*), longfin yellowtail (*Seriola rivoliana*), golden grey mullet (*Chelon auratus*), thicklip grey mullet (*Chelon labrosus*) and meagre (*Argyrosomus regius*).
- Crustaceans: whiteleg shrimp (*Penaeus vannamei*)
- Molluscs: abalone (*Haliotis tuberculata coccinea*)
- Echinoderms: *Holothuria* spp.
- Macroalgae: *Ulva* spp. and *Gracilaria* spp.

2.29.1ULPGC - Feed Ingredients and Additives Testing Unit

Location: Telde, Gran Canaria (Spain)
Contact: Daniel Montero (daniel.montero@ulpgc.es)

FITU offers two series of 15 digestibility tanks (0.2 and 0,5 m3), three wet labs with 170 tanks of 0.1, 0.2, 0.5 and 1 m3, and two lines for commercial scale testing, provided with computer controlled automatic, auto-demand or manual feeding and waste feed collectors (feed intake control). Photoperiod control is also available in 0.1, 0.2 and 0.5 m3 tanks. FITU offers an ingredient processing laboratory, a feed production hall, two series of digestibility tanks, and three wet labs to test diets and ingredients for either larvae (including automated start feeding), juveniles or breeders of marine fish species, both commercial or new species for aquaculture. It also has access to a complete nutrition laboratory equipped where all lipid, protein, aminoacids, fatty acids, lipid classes, vitamins, pigments, toxins, dioxins, PCBs and certain minerals from ingredients, feeds, live preys, seaweeds, molluscs, fish, turtles and marine mammals are daily analysed.

Services

FITU offers two series of 15 digestibility tanks (0.2 and 0,5 m3), three wet labs with 170 tanks of 0.1, 0.2, 0.5 and 1 m3, and two lines for commercial scale testing, provided with computer controlled automatic, auto-demand or manual feeding and waste feed collectors (feed intake control). Photoperiod control is

also available in 0.1, 0.2 and 0.5 m3 tanks. FITU offers an ingredient processing laboratory, a feed production hall, two series of digestibility tanks, and three wet labs to test diets and ingredients for either larvae (including automated start feeding), juveniles or breeders of marine fish species, both commercial or new species for aquaculture. It also has access to a complete nutrition laboratory equipped where all lipid, protein, aminoacids, fatty acids, lipid classes, vitamins, pigments, toxins, dioxins, PCBs and certain minerals from ingredients, feeds, live preys, seaweeds, molluscs, fish, turtles and marine mammals are daily analysed.

2.29.2 ULPGC - Marine BioAssays Station

Location: Telde, Gran Canaria (Spain)
Contact: Daniel Montero (daniel.montero@ulpgc.es)

MBS offers three independent RAS units, fully equipped to test up to three different pathogens at the same time in larvae, juveniles or breeders of marine fish. Each RAS unit includes 18 tanks of 0.5 m3, each equipped with automatic water renewal, oxygen, temperature, pH, and feeding system, all with control and monitoring at real time. MBS offers three main RAS units completely equipped to challenge separately with up to three different pathogens at the same time, in all phases of fish life cycle including breeders, larvae and juveniles of marine fish species. In each RAS unit, 6 treatments in triplicate are available. The design of RAS units is versatile, which allows a great amount of testing conditions and assays in vivo with pathogens. It also has a support laboratory in situ, as well as access to the Fish Pathology lab.

Services

MBS offers three main RAS units completely equipped to challenge separately with up to three different pathogens at the same time, in all phases of fish life cycle including breeders, larvae and juveniles of marine fish species. In each RAS unit, 6 treatments in triplicate are available. The design of RAS units is versatile, which allows a great amount of testing conditions and assays in vivo with pathogens. It also has a support laboratory in situ, as well as access to the Fish Pathology lab.

2.29.3 ULPGC - Warm Water Species Selection Unit

Location: Telde, Gran Canaria (Spain)
Contact: Rafael Ginés (rafael.gines@ulpgc.es)

WWSSU offers 82 tanks of different volumes (0.5, 1 and 2 m3), all of them equipped with automatic control of feeders and photoperiod, and monitoring of water renewal, temperature and oxygen (environmental parameters). In addition, under caudal disruption and air supply fail, oxygen is injected automatically in main water line or tank. According to IoT approach (Internet of Things), the information of environmental parameters is available at the website, for any user level. WWSSU allows genetic experiments - crossbreeding, inbreeding, epigenetic crosses - or selection programs for families of, at least, 48 half sibs or 96 full sibs, or more when mass spawning is used. Fish culture is possible from larvae until adults. This installation is complemented with different labs for molecular and quantitative genetics, morphology lab based on image processing for detecting deformities among physical features, and meat and fish quality analysis.

Services

WWSSU offers 82 tanks of different volumes (0.5, 1 and 2 m3), all of them equipped with automatic control of feeders and photoperiod, and monitoring of water renewal, temperature and oxygen (environmental parameters). In addition, under caudal disruption and air supply fail, oxygen is injected automatically in main water line or tank. According to IoT approach (Internet of Things), the information of environmental parameters is available at the website, for any user level. WWSSU allows genetic experiments - crossbreeding, inbreeding, epigenetic crosses - or selection programs for families of, at least, 48 half sibs or 96 full sibs, or more when mass spawning is used. Fish culture is possible from larvae until adults. This installation is complemented with different labs for molecular and quantitative genetics, morphology lab based on image processing for detecting deformities among physical features, and meat and fish quality analysis.

2.30 Toralla Marine Science Station (ECIMAT-UVIGO)

The Marine Research Centre of the University of Vigo (CIM-UVIGO) is the core element of the University of Vigo´s marine strategy, being a reference pole at the local, national and international levels in the generation and transfer of interdisciplinary knowledge in the marine field. Comprising 228 researchers, CIM focuses on four core areas: aquaculture and sustainable fisheries, marine pollution, climate change impacts, and marine renewable energy. These priorities and areas are supported by a socio-ecological perspective and data intelligence.

Expertise: Aquaculture, Fisheries, Biotechnology, Environment
Location: Vigo (Spain)
Website: https://cim.uvigo.gal/en/ecimat/toralla-marine-science-station/
Contact: Maria Huete Ortega (maria.huete@uvigo.gal)
Related Infrastructures: EMBRC

The CIM benefits from its exceptional state-of-the-art infrastructure of the Toralla Marine Science Station (ECIMAT), where cutting-edge research on aquaculture, the impact of climate change on the marine environment, and the exploration of novel biotechnological solutions derived from marine sources takes place. The ECIMAT has been granted international recognition as a part of the European Research Infrastructure European Marine Biological Resource Centre (EMBRC-ERIC) by the EC, further solidifying its status as a world-class facility for marine research. Evolving from a research support facility providing services to the local research community, ECIMAT now hosts a thriving research cluster, consolidating the marine science capabilities of the University of Vigo. Today this cluster provides services to researchers both from public and private institutions from all over the world. Through its participation in EMBRC, more than 40 researchers coming from institutions in Europe and beyond have accessed ECIMAT and its services over the last few years.

Services

Located on the southwestern edge of Ría de Vigo, Toralla Island, ECIMAT enjoys a strategic position within the Northwestern Iberia upwelling system. This setting provides direct access to a diverse range of coastal ecosystems, including rocky and sandy intertidal zones, mudflats, pristine coastal areas, estuaries, and seagrass maerl beds. This privileged location offers researchers a unique opportunity to study and explore various marine habitats and their ecosystems in one consolidated area.

ECIMAT is equipped with state-of-the-art facilities for conducting research on seawater and marine cultures, ranging from experimental to pilot scale. The station comprises three floors of modular, flexible, and functional buildings, housing a variety of laboratories and specialized rooms. These include research laboratories, service laboratories (both wet and dry), temperature-controlled rooms, freezing rooms, and auxiliary cultures for phytoplankton and zooplankton. The laboratories are outfitted with top-quality air, oxygen, freshwater, and tap water lines, available at three different temperatures and varying levels of filtration and sterilization. This ensures that researchers have access to precisely controlled environmental conditions essential for their experiments and studies.
ECIMAT offers advanced facilities and specialized services for marine science research. This includes dedicated laboratories for aquaculture and global change studies, offshore and floating mesocosm facilities for experiments, technological platforms for marine environment research, provision of marine biological resources and model organism culturing, access to coastal ecosystems via small boats and a 20 m research vessel up to the continental shelf edge, real-time oceanographic data support, and processing and analysis services for water samples, sediments, and marine organisms.
The ECIMAT´s service offer is complemented by the know-how and research expertise provided by the UVIGO´s researchers that belong to the CIM, which for this project will offer also services such as tools for marine contamination monitoring; -omics technologies for the early detection of bivalve larvae diseases, taxonomical profiling of bacterial communities in microalgae and bivalve culturing systems, marine microbiomes bioprospecting of new products and enzymes; study of the biology and ecology of cephalopods; cryopreservation- conservation of parental lines for aquaculture selective breeding; integral assessment of feeding, environmental of culture conditions; and parasites diseases, detection and control in fisheries and aquaculture.

Bioresources available

ECIMAT has a small biobank of marine organisms as well as expertise for applying and developing cryopreservation protocols for the biobanking of Marine Biological Resources. Additionally, ECIMAT offers aquaria and tanks for the rearing of many type of marine organisms such as equinoderms (sea urchin is cultured all around the year), *Aurita aurelia*, sea cucumber, octopus, different species of fishes (Sea bass, Sea bream) and shellfish (mussels, clams, flat oyster...) and has facilities and equipment to culture microalgae and zooplankton to feed these organisms. Finally, ECIMAT facilities and expertise are able to rear the following model organisms: Sea urchin, Cyprinodon variegatus, *Gasterosteus aculeatus* and Rainbow Trout.

Support offered

The facilities have extensive experience in providing access to external users. Before the arrival, administrative support will assist with reservations and travel arrangements. During the trans-national access administrative, technical and scientific personnel will be assigned to the users to support them in their research activities if necessary and the scientific expertise of the installations will be at their disposal, being the users fully integrated in the daily scientific activities of the facilities. Training in the use of the platforms and equipment will be provided. No lodging will be provided in the installations. In-house kitchen facilities are available and apartments for rent and hotels will be accessible via public transport. Users will be expected to provide a seminar and a report of the visit.

Modality of access

Access to ECIMAT-UVIGO will be provided on the basis of unit costs (person-day) or as actual costs for some specific services depending on the service. The degree of independence of the user during their work will depend on the research planned and will be possible within the access scheme proposed.

2.31 Estación Marina de Plentzia (PIE-UPV/EHU)

PiE-UPV/EHU is the marine station of the University of teh Basque Country (UPV/EHU) and is one of the founding members of EMBRC. It is located on the beach of Plentzia, 15 mins from the international airport of Bilbao and connected by metro to Bilbao centre. Research and education missions are mainly in the realm of environmental health assessment in estuarine and coastal ecosystems, mainly environmental toxicology. Provides complete access to its tripartite One Health marine Laboratory with its environmental monitoring network, its Biscay Bay environmental Specimen Bank and the Basque Microalgae culture collection and its experimental aquaria. Experience in the assessment of health biomarkers from the molecular to ecological level are offered through its "Platform for Health Biomarker assessment" to study any aspects related to health of breed in captivity or wild marine organisms. Special focus in the One-Health approach with its Plentzia Bay Observatory Lighthouse. PIE-UPV/EHU offers access to more than 2750 in house and external users (only research) and has offered more than 300 units of transnational access in the H2020 Assemble plus project and access to more than 50 researchers in the framework of the super-stop of the EMBL-TREC expedition.

Expertise: Aquaculture, Biotechnology, Environment, One-Health, Ecotoxicology, Analytical chemistry
Related Infrastructures: EMBRC
Location: Plentzia (Spain)
Website: https://www.ehu.eus/PIE/
Contact: Xabier Lekube (xabier.lecube@ehu.eus)

Services

PiE-UPV/EHU offers two services. The One Health Marine Lab (ONEMARLAB) that offers three interconnected activity domains to be accessed independently or together for "One Health" research with aquatic organisms and a chemical, histological, cellular and molecular platform for the assessment of health biomarkers.

1. One Health Marine Lab (ONEMARLAB)

a. Coastal monitoring network

Coastal monitoring network continuously accessing pristine and contaminated estuarine and coastal sites. This periodical monitoring network is available for visiting researchers and for provision of marine biological resources. Targeted access to selected ecosystems is also provided, specially in mud-flats, rocky and sandy intertidal shores.

b. Biscay Bay Environmental Biospecimen Bank and Basque Microalgae Culture Collection

The Biscay Bay Environmental Biospecimen Bank-BBEBB (http://www.ehu.eus/PIE/index.php/bbebb-2/) is part of the International Environmental Specimen Bank Group-IESB promoting the world-wide development of techniques and strategies of environmental specimen banking. The BBEBB contains frozen, dry and histological samples, and high-resolution scanned microscopy slide images from: 1) different monitoring campaigns mainly in the Southern Bay of Biscay and 2) samples of model organisms experimentally exposed in-house to diverse chemicals. In general, the BBEBB contains tissues of fish, stranded marine mammals, and molluscs. Storage of such samples allows retrospective analysis of environmental health through the application of biomarker, biometry and analytical chemistry techniques. Samples can be searched through the following database: http://pie-bbebb.ehu.eus/default.aspx. Biobanking experimentation is also possible.

The Basque Microalgae Culture Collection-BMCC (https://www.ehu.eus/es/web/bmcc) maintains over 600 strains of marine and freshwater microalgae and cyanobacteria (many causing toxic blooms), mostly from the Basque Country. The BMCC was officially registered in 2020 in the World Federation for Culture Collections (WFCC) and is part of the Spanish Network of Microorganisms (REDESMI). The collection is growing monthly, and its strain catalogue can be browsed here: https://www.ehu.eus/es/web/bmcc/buscador. The cultures are provided alive, as 10 ml inoculums but larger volumes can be provided upon request.

c. Experimental aquaria for toxicity testing and study of mechanisms of stress action

Experimental aquaria (http://www.ehu.eus/PIE/index.php/experimental-aquaria2/) at PiE-UPV/EHU offer a wide range of possibilities to study effect of environmental variables (including exposure to chemicals, nutrition experiments, water physicochemical alterations, different stress conditions) using/growing marine algae, invertebrates (molluscs, echinoderms, crustacean...) and fish as test organisms. Experimentation can be performed from gametes to adult organisms. Features of these aquaria include:

- Metal free
- Independent regulation of photoperiod and temperature (14-22ºC) with a titanium plate interchanger. Experimental set-ups at lower temperatures are feasible.
- Flow-through and closed systems
- Data logger for continuous recording of physicochemicals

- Equipped with their own depuration plant organised in three depurations lines (organic material, hydrocarbons, metals) allowing experimenting with a range of contaminants without harming the local depuration plant
- Experimentation tanks with volumes from 1 to 1000 litters and with two outdoor mesocosms of 20000 litters each
- Specific filtration units for specific experiments if required.

2. Platform for the assessment of health effect biomarkers

Analytical chemistry, molecular, biochemical and histological platforms for the analysis in sentinel organisms (collected in their natural habitat or after experimentation under laboratory conditions) of molecular, cell and tissue level biomarkers of:

1- Exposure to toxic chemical compounds)

2.- Effects of exposure to environmental change (adaptive and maladaptive responses to environmental change)

(Bioaccumulation, Metal exposure, Oxidative stress, xenoestrogenicity, mutagenicity, heat shock, histopathology, toxicity testing, in vitro assays, cell viability....).

Bioresources available

The Basque Microalgae Culture Collection-BMCC (https://www.ehu.eus/es/web/bmcc) maintains over 600 strains of marine and freshwater microalgae and cyanobacteria (many causing toxic blooms), mostly from the Basque Country. The BMCC was officially registered in 2020 in the World Federation for Culture Collections (WFCC) and is part of the Spanish Network of Microorganisms (REDESMI). The collection is growing monthly, and its strain catalogue can be browsed here: https://www.ehu.eus/es/web/bmcc/buscador. The cultures are provided alive, as 10 ml inoculums but larger volumes can be provided upon request.

Experience in lab based experimentation marine algae, invertebrates (molluscs, echinoderms, crustaceans, cnidarians, polychaetes, rotiferes...) and marine fishes as test organisms.

Support offered

The installations have an extensive experience in providing access to external users. Before the arrival, administrative support will assist with reservations and travel arrangements. During the trans-national access administrative, technical and scientific personnel will be assigned to the users to support them in

their research activities if necessary and the scientific expertise of the installations will be at their disposal, being the users fully integrated in the daily scientific activities of the facilities. Training in the use of the platforms and equipment will be provided. No lodging will be provided in the installations. In-house kitchen facilities are available and apartments for rent and hotels will be at walking distance from the stations. Users will be expected to provide a seminar and a report of the visit. Support for permits and authorisations is offered as explained in the deliverable 1.10 of Aquaserv.

2.32 University of Gothenburg (UGOT)

The University of Gothenburg is the leading university in Sweden for studies in the marine sciences. It is also the only university that offers marine science courses in biology and chemistry, as well as in geology and oceanography. The Department of Marine Sciences is the host department for the Marine Infrastructure at the University of Gothenburg hosting the national infrastructure Kristineberg Center for marine research and innovation and the Tjärnö marine station.

Expertise: Aquaculture, Fisheries, Biotechnology, Environment
Related Infrastructures: EMBRC
Location: see specific information for each facility
Website: see specific information for each facility
Contact: see specific information for each facility

Services

The station has documented expertise in collecting and culturing a wide range of aquaculture species including seaweeds (*Ulva spp, Saccharina latissima*), Oysters (*Ostrea edulis, Magallana gigas*), Sea urchins (*Echinus esculentus*), sea cucumber (*Parastichopus tremulus*). Many other species are easily accessible in the vicinity of the marine stations, including mussels (*Mytilus edulis*), lobsters (*Homars gammarus, Nephrops norvegicus*), shrimps (*Pandalus borealis*), and large variety of fish. Local expertise includes world class research on global change biology, ecosystem restoration, and sustainable aquaculture (multi-trophic aquaculture, blue food). Both marine stations are visited by hundreds of international guests every year.

Support offered

The technical will be available to the guest scientists. This includes support for sampling (ship crew), laboratory set-up, specific expertise in the use of equipment (e.g. microscopes). Help will also be provided for the logistics (travelling, accommodation, meals, shipment of material and samples) by a local coordinator and the reception staff. Guest scientists will also be provided with office space, access to the internet, and a library service. Both stations have small libraries with monographs, class collections of the most useful field guides covering all marine groups of organisms. Central university online library services are available.

Modality of access

Each project will be allocated resources for 1 to 2 scientists for a duration of 30 days per person (max of 60 days per project). Ship time will be allocated on a project basis for a maximum of 12h per project. Unit of access will include access to the facilities and technical staff (bench fees), accommodation and full board.

2.32.1 Kristineberg Center for Marine Research and Innovation (UGOT-KMRS)

Location: Fiskebäckskil (Sweden)
Website: www.gu.se/en/kristineberg
Contact: Sam Dupont (sam.dupont@bioenv.gu.se), Andrea Norder (andrea.norder@gu.se), Linus Hammar Perry (linus.hammar@gu.se), Simon Ungman Hain (simon.ungman.hain@gu.se)

The research station at Kristineberg is situated on the Gullmarsfjord, the largest and only true fjord in Sweden. The fjord is 30 km long with a maximum depth of 118 m and has been a natural reserve since 1983. Key features that make this important marine environment unique in Europe are: the excellent water quality with two rather distinct water-masses; brackish surface water originating from the Baltic and oceanic water from the North Sea at greater depths; a large number of habitats, resulting in a very high biodiversity and a unique fauna.

The marine station of Kristineberg (KCMRI) provides extensive culturing facilities allowing cultivation of a wide range of aquaculture species. These include small-large tanks and aquaria (5-80L) for experimental use available including both indoor and outdoor supplied with through-flow surface and deep saltwater. Ten climate control rooms with running (surface, deep) saltwater allowing the control of parameters including air-/water temperature, salinity, light, pH. Large wet laboratories are available for researchers, including cold rooms and freezer rooms. KCMRI: Eight fully equipped large dry laboratories, DNA lab, chemical lab, microscopy lab. Imaging facilities include Leica M²05 C Motorized Stereomicroscope with a Zeiss Axiocam 305 color connected to computer with Zeiss Zen microscope imaging software; Leitz DMRBE Fluorescence Light microscope with a Zeiss Axiocam 705 color connected to computer with Zeiss Zen microscope imaging software. Two large vessels (Oscar von Sydow, 12m & Alice, 12m), plus 4 smaller boats. Sampling equipment includes boxcores, Grabs, dredges, trawls, plankton nets, ROV for videorecords and also for picking samples using a robotic arm. It has a DNA lab equipped for DNA extraction and library preps, including control devices for DNA quality checks. It has large wet laboratories for students and/or researchers, including cold rooms and freezer rooms. Extensive

scientific diving services are offered all year round. Visitors can also access long-term datasets. Long-term temperature and salinity time series (not quality controlled), plankton composition (https://sharkweb.smhi.se). Extensive genomic data for model organisms (https://www.gu.se/cemeb-marin-evolutionsbiologi). Genetic monitoring timeline for hard bottom since 2018 (www.arms-mbon.eu). Extensive ROV footage available from 1996. Long term monthly monitoring at 3 stations (BroA, Släggö and Alsbäck) including plankton (abundance, species composition, carbon content), primary productivity, chlorophyll, and physico- (salinity, temperature, turbidity) and chemical parameters (NH4, NO3, NO2, PO4, O2). All data are available at: https://sharkweb.smhi.se/. KCMRI weather station collecting data on air (temperature, atmospheric pressure, wind, humidity, precipitation) and water (sea level, temperature, salinity). All data are available at: https://www.weather.mi.gu.se/kristineberg/en/. Historical species observation data (1890-recent) available through www.sbdi.se and https://artportalen.se/

2.32.2 Tjärnö Marine Laboratory (UGOT-TML)

Expertise: Aquaculture, Fisheries, Biotechnology, Environment
Related Infrastructures: EMBRC
Location: Strömstad (Sweden)
Website: www.gu.se/en/tjarno
Contact: Marina Antonina Zoe Panova (marina.panova@marine.gu.se)

Tjärnö (TML) marine station: extensive culturing facilities allowing cultivation of a wide range of aquaculture species. These include small-large tanks and aquaria (5-80L) for experimental use available including both indoor and outdoor supplied with through-flow surface and deep saltwater. Ten climate control rooms with running (surface, deep) saltwater allowing the control of parameters including air-/water temperature, salinity, light, pH. Large wet laboratories are available for researchers, including cold rooms and freezer rooms. DNA lab equipped for DNA extraction and library preps, including control devices for DNA quality checks. Both stations have large wet laboratories for students and/or researchers, including cold rooms and freezer rooms. Extensive scientific diving services all year round. Visitors can also access long-term datasets. Long-term temperature and salinity time series (not quality controlled), plankton composition (https://sharkweb.smhi.se). Extensive genomic data for model organisms (https://www.gu.se/cemeb-marin-evolutionsbiologi). Genetic monitoring timeline for hard bottom since 2018 (www.arms-mbon.eu). Extensive ROV footage available from 1996. Long term monthly monitoring at 3 stations (BroA, Släggö and Alsbäck) including plankton (abundance, species composition, carbon content), primary productivity, chlorophyll, and physico- (salinity, temperature, turbidity) and chemical parameters (NH4, NO3, NO2, PO4, O2). All data are available at: https://sharkweb.smhi.se/.

KCMRI weather station collecting data on air (temperature, atmospheric pressure, wind, humidity, precipitation) and water (sea level, temperature, salinity). All data are available at: https://www.weather.mi.gu.se/kristineberg/en. Historical species observation data (1890-recent) available through www.sbdi.se and https://artportalen.se/

2.33 Umeå Marine Sciences Centre (UMEA)

Based at Umeå University, Umeå Marine Sciences Centre (UMF) is a dynamic environment for marine research, education and environmental monitoring. Umeå University is a public research university located in Umeå, in the mid-northern region of Sweden. The university was founded in 1965 and is the fifth oldest within Sweden's present borders.

Expertise: Aquaculture, Environment
Related Infrastructures: EMBRC
Location: Norrbyn (Sweden)
Website: https://www.umu.se/en/umea-marine-sciences-centre
Contact: Regina Kolzenburg, Nicholas Kamenos (regina.kolzenburg@umu.se, nick.kamenos@umu.se)

Present research projects at UMF focus on effects of land–sea interactions and climate change on marine food-web structure and function, as well as on the origin, impact, and remediation of anthropogenic environmental pollution. Experimental facilities allow research on disease challenges, contaminants, light field, salinity and heatwave effects on aquaculture. Mesocosms are supplied with a cooling/heating system, aeration, full salinity range and mechanical and biological filtration allowing the administration of contaminants and/or pathogenic agents to the marine organisms of aquaculture focus. Outflows have specific scrubbers for pathogen removal.

Services

The indoor mesocosm facility consists of 12 cylindrical mesocosms with water columns 4.86 m high and 0.74 m in diameter. Temperature can be controlled at 3 different sections on each mesocosm. This enables projects that require stratification, controlled convective stirring or both. Projects that require ice can be carried out, and parameters such as freezing or thawing rate can be adjusted. The eight channel light sources are especially produced with the aim to closely mimic the spectrum and intensity of the sun at every hour of the day. For example, this is well-suited for investigation into the roles of changing light fields on aquaculture species including algae or studies requiring real-world simulations. The intake water is pumped in directly from the sea from 800 m offshore. It is possible to pre-filter intake water to any desirable size down to 1 µm and sterile filtration, it is also possible to adjust the salinity between fully marine to low salinity levels (i.e. 33 – 4). The experimental halls consist of two parts with a combined area of 170 m3 including rooms for aquaria and two climate rooms. The experimental halls are primarily intended for flow-through experiments with running seawater. Four

different streams of running water are fed into these halls, three of which can be temperature controlled. Experiments are carried out using aquaria or tanks of various sizes and up to 1 m3; the facility is also equipped with a state-of-the-art cleaning section allowing for experiments with toxic substances such as pharmaceuticals. This facility is licensed for the use of vertebrate aquaculture species (i.e., fish). Associated available infrastructure: RV Botnica (22m), a hovercraft, 7 boats of less than 16m (incl. Nereus, 16 m; Doris, 8.5 m) and an associated scientific dive team are available for the collection of aquaculture species of interest. Data from monitoring activities from several sites in the Gulf of Bothnia both coastal and offshore are available in the databases dBotnia and BEDA covering 30 years of times series: hydrography, chemistry (nutrients, pH, alkalinity, DOC, humic substance, oxygen), biology (bacteria biomass and production, phytoplankton biomass and species composition as well as primary production, zooplankton composition, benthic fauna). Additionally, a live feed as well as historic data from a nearby coastal buoy can be accessed to obtain in situ oceanographic (temperature, salinity, turbidity, currents, conductivity, meteorological station, Oxygen, pCO2) and biological data (e.g. chlorophyll a). Two large student labs for 24 persons each, one general purpose research lab with 6 places, DNA lab, chemical ecology lab and histology lab plus additional specific rooms for microscope work, RNA work and isotope work. Laboratory space (including two large general purpose dry laboratories with capacity for 20 scientists, wet laboratories for visitors) includes access to all standard laboratory instrumentation such as microscopes, sensors, analytical instruments (such as , Zeiss microscopes with imaging software for bacteria analysis; imaging system for microplankton analysis) and -80 freezers. Additionally, UMF can provide ice proof floating marine mesocosms (n = 9) and a fully equipped omics lab at UmU including aDNA capacity. Analyses capacity on site include DIC, elementary analysis, nutrients -total and inorganic-, total alkalinity, pCO2, chlorophyll a, humic substance, CDOM, SPM, turbidity, ROV with video capacity, lecture hall with seating capacity for 30 scientists. Access to boats and transportation with seagoing research vessels is also ensured if, for example, biological material for Aquaculture experiments needs to be collected. Guests can be accommodated in a hostel with 20 beds and cooking facilities about 500 m from the field station. The experimental halls were recently renovated and upgraded with a cleaning section allowing for projects that include organic toxic compounds in running water experiments, making it one of few infrastructures where such projects can be carried out. Lodgings and restaurants are available in the nearby town of Hörnefors. About 100 international researchers have used our facilities during experiments conducted over the past 13 years. The mesocosm indoor facility has successfully and reliably been used in Transnational Access projects within the framework of MESOAQUA, AQUACOSM and AQUACOSMplus, as well as in local projects. The first full winter experiment using indoor ice-covered water mesocosms was also conducted within

AQUACOSMplus during the winter 2021-2022. Since 2010, ca. 20 peer-reviewed scientific publications including aquaculture related studies using mesocosm facilities were published.

Bioresources available

Isolation and culturing facilities such as temperature controlled rooms in various sizes and incubators are available and can be adjusted to a wide range of temperature and light conditions.

Support offered

A dedicated person at UMF is responsible for the technical operation of mesocosms and experiment halls during a TA-project. This includes testing of operational parameters, surveillance, and maintenance of the facility before and during an experiment. Help with logistic coordination of equipment and consumables between UMF and visiting groups will be provided. Scientific personnel are available to assist with practical and scientific coordination of projects. UMF also provides other logistic support needed on site, including office and lab space, meeting rooms and a library. Access to boats and transportation with seagoing research vessels is also ensured if for example biological material for Aquaculture experiments needs to be collected. Guests can be accommodated in a hostel with 20 beds and cooking facilities about 500 m from the field station. Lodgings and restaurants are available in the nearby town of Hörnefors. About 100 international researchers have used the mesocosm facility during numerous experiments conducted over the past 13 years.

Modality of access

The users will have access to all the facilities at the field station. Groups of visiting scientists can work on independent projects, in the mesocosm hall, experimental halls and adjacent laboratories. The unit of access includes preparatory work at UMF, working in projects, and cleaning up/taking care of equipment after project end. All these activities must be done in person at UMF.

2.34 Tübitak Marmara Research Center (TUBITAK)

The Tübitak Marmara Research Center (MAM) aims at becoming a world leader in science and technology with research, development and innovation capabilities in the areas of Energy Technologies, Climate Change and Sustainability, Materials Technologies and Life Sciences. The Food Institute focusses on 'food processing technologies', 'food packaging and preservation', nutrition and functional foods' and 'food safety and quality'. The Seafood Pilot Processing line consists of sub-lines for fish cleaning, portioning and filleting (grader, conveyor, filleting table, angle flow table, trimming table, pin bone removing, spinning product flow table, fish skinner, pressing & lifting system, labelling machine); formed product production (mixer & mincer, drying centrifuge, forming machine, flour coating machine, battering machine, crumbing machine, frying machine); smoked and canned fish production (salting table & brine mixture tank, carrying trolleys, can seaming machine, smoke chamber, smoked salmon slicing machine, portion cutter); packaging and pasteurisation equipment. The advanced Food Safety Laboratory is equipped with analytical instruments such as GC-MS/MS, Q Exactive Orbitrap Mass Spectrometer; UPLCs with different detectors; ICP-MS for heavy metal and mineral analysis; Isotope ratio mass spectrometry (IRMS) (equipment for determination of natural and synthetic samples based on their isotope ratios); Simulator of the Human Intestinal Microbial Ecosystem (SHIME) – being purchased: It is a validated in vitro model, simulating the complexity of the gastrointestinal tract. The equipment allows simulation of the full gastrointestinal tract from stomach to distal colon and includes all other basic instruments for safety and quality control of foods including fishery products.
Additionally, it has batch processing equipment and laboratory instruments for official food analysis laboratory such as; extraction systems (classical, supercritical, ultrasound-assisted, microwave-assisted extraction), drying systems (freeze-drying, spray drying, drum drying, tunnel drying), purification (chromatographic systems), encapsulation (fluidized bed drying, spray drying), characterization (chromatographs ftir, dsc, sem), LC-MS/MS, HPLC, GC, Spectrophotometer, microbiology laboratory, laboratory equipment for bioactivity analysis, rheological studies and texture analysis. The services offered include the possibility of development of new food products, functional foods, food formulations, pilot scale-up, development and/or application of new extraction and purification techniques, characterization, encapsulation, analytical tests, quality control, food safety studies, shelf life evaluation, in vitro studies on health effects of biocompounds, bioavailability, digestibility, sensory analysis, texture analysis, rheological analysis, utilisation of food processing by-products including fish by-products, food packaging studies

Expertise: Biotechnology, Food / Social

Related Infrastructures: METROFOOD
Location: Gebze, Kocaeli (Turkey)
Website: https://mam.tubitak.gov.tr/en
Contact: Elif Yener (elif.yener@tubitak.gov.tr)

Services

The services offered include the possibility of development of new food products, functional foods, food formulations, pilot scale-up, development and/or application of new extraction and purification techniques, characterization, encapsulation, analytical tests, quality control, food safety studies, shelf life evaluation, in vitro studies on health effects of biocompounds, bioavailability, digestibility, sensory analysis, texture analysis, rheological analysis, utilisation of food processing by-products including fish by-products, food packaging studies

Support offered

Users have access to all facilities of the fishery processing line/equipment and laboratories of international standard. Users will have the opportunity to interact with TUBITAK's experts for their specific needs and additional experimental requirements. Moreover, other TUBITAK facilities such as processing lines for different food products, laboratory instruments for different characterization purposes are available to users under the specific rules of TUBITAK.

Modality of access

Access can be both on-site and remote, based on actual costs. Users will be able to carry out processing and laboratory experiments themselves, but have the option of remote access by shipping samples for processing/laboratory analysis by local technicians or scientists. The access includes experimental set-up, to be defined according to the specific information provided by the users, organisation, sample pre-treatment and analytical measurements, data processing and elaboration results. Typically, the provision of a service requires 1 week per access, even if it can vary according to the type of samples, the required analysis/process and the required conditions. It is estimated to provide 6 accesses of 1 week and 40 processing access and 80 lab access in 20 weeks for 5 years (4 weeks for each year).

2.35 University of Stirling's National Aquaculture Technology and Innovation Hub (USTIR)

The University of Stirling's National Aquaculture Technology and Innovation Hub (NATIH) includes tropical and temperate recirculated aquarium facilities within the Institute of Aquaculture on the main university campus, and larger aquarium systems in two remote locations. The first of these is the Niall Bromage Freshwater Research Facility which is at Buckieburn, to the South of Stirling City. The other external facilities is Machrihanish Marine Environmental Research Laboratory (MERL) which is in Machrihanish, Argyll. These sites are very closely integrated, and their activities are entirely complementary. Fish can be moved between sites for experimental and management purposes.

Expertise: Aquaculture, Environment
Related Infrastructures: AQUAEXCEL
Location: Stirling (United Kingdom)
Website: www.aqua.stir.ac.uk/
Contact: Sonia Rey Planellas, Sushee Dunn (sonia.reyplanellas@stir.ac.uk, sushee.dunn@stir.ac.uk)

Support offered

The Institute has hosted many visiting scientists and is therefore experienced in providing support and assistance particularly to Early Career Researchers. All visiting scientists are attached to a senior member of staff who assists them in developing their research and dealing with administrative matters. In general visitors will be invited to work in one of the three active research groups that cover most aspects of research devoted to developing a sustainable aquaculture sector globally. Depending on the nature of the study we can offer multidisciplinary research collaboration opportunities that are unavailable in many other Institutions. With many existing programs in place, we can attach visiting scientists to work alongside Institute staff with training skills in the required techniques as well as access to a wider network of collaborators. When the academic support and training, specialist fish holding facilities, defined fish strains, and well-equipped modern laboratories focused on specific research themes are combined, the visiting scientist is getting a world-class research experience moulded to their exact requirements.

Modality of access

Users will develop their own research projects, normally in consultation with appropriate staff at the IOA, and will be supported in carrying them out as required. A senior scientist within the Institute will

liaise with the applicants and research group leaders to determine whether the available facilities are appropriate for the planned research. If appropriate facilities are available the most suitable timing and duration for the visit will be determined given the needs of the visiting researcher, other demands on the facilities and staff and the degree of support required. Duration of work: The duration of individual projects will depend on their objectives, but a typical trial is expected to last 8 weeks. Unit of access: one system week. A unit of access involves a system of 12 tanks in one of the facilities for one calendar week. Each user will receive access to all necessary animals, equipment and consumables needed to complete their research project, as agreed in their project proposal. In addition, users will be provided with any necessary technical assistance, training and advice on methodologies, risk assessment, experimental design and data analysis. Users will have full access to computing and office facilities, and will also be able to obtain use of all normal university central facilities. Users may be able to combine access to UoS-NATIH with access to other infrastructures if this increases complementarity. Users may also be able to access remote facilities, including commercial aquaculture sites, research vessels, or other laboratories. Method used to declare access costs: Unit cost. Expected output/deliverables for users: In most cases we have found that visiting scientists wish to undertake joint research with Institute staff and that this collaboration will often continue into the future thus promoting closer networking within the European research area. In our experience the great majority of visitors to the Institute have carried out research which has led to publications in international peer-reviewed journals.

Services

The offered research aquaria are part of the National Aquaculture Technology and Innovation Hub which includes the Institute of Aquaculture, which has around 40 academic staff with full technical and administrative support and a large cohort of PhD students, providing a very supportive and stimulating environment for visiting researchers. The Institute of Aquaculture laboratories cover a wide range of analytical capabilities for water quality and nutritional analysis and advanced imaging. The range and quality of research undertaken at the Institute, together Collaborative projects include: development of commercial and trial vaccines against fish pathogens; development of diagnostic reagents, chemotherapeutants and genetic probes against fish pathogens; selective improvement programmes based on genetic and genomic technologies; development of cloned lines of fish; improved polyunsaturated fatty acid nutrition of marine fish larval feeds and antioxidant protection; fish oil substitutions in salmonid diets; and evaluation of the mechanisms underlying the control of sexual maturation in salmonids and marine finfish. The Institute plays hosts to a range of national and international visitors each year who stay to carry out research for periods ranging from 5-90 days particularly through the H2020 - AQUAEXCEL2020 project.

2.35.1 USTIR - Niall Bromage Freshwater Research Unit (USTIR-NBFRU)

The Niall Bromage Freshwater Research Unit (NBFRU) has 216 m² of tank space including flow-through and recirculated systems suitable for genetics, reproductive and nutritional studies on salmonids. The Niall Bromage Freshwater Research Unit at Buckieburn has 185m³ of flow through tank space and a state-of-the-art 18m³ of RAS system (24 tanks, 18m³) tank space and a new purpose-built salmonid ova hatchery, suitable for genetics, reproductive, sterility and nutrition studies on salmonids and other temperate freshwater species.

2.35.2 USTIR - Marine Environment Research Laboratory (USTIR-MERL)

The Marine Environment Research Laboratory (MERL) has ca. 150 tanks providing 375 m² experimental area; and a marine fish hatchery with live feed production. Species held on site include salmon, ballan and goldsinny wrasse. There is a filtered sea water supply and temperature and photoperiod controlled systems are available. The Marine Environment Research Laboratory at Machrihanish has around 150 tanks from 0.1 to 13 m3 hosting academic and contract trials. The site is primarily flow-through, but bespoke recirculating systems can be built. The Stirling campus offers an environmentally controlled facility and can support a wide diversity of aquatic species both tropical and temperate. Multiple freshwater RAS systems are available distributed across 6 independent CT rooms ranging from replicated single RAS systems; 6 RAS each with 500L triplicate tanks in a single CT room to smaller zebrafish-style tank systems providing maximum flexibility for experimental design.

AQUASERV

Appendix

Appendix

A1. Glossary

Access Officer
The Access Officer (AO) is responsible for overseeing and coordinating the Transnational Access programme in AQUASERV.

Access Manager
The contact person at the Access Provider is responsible for communicating with the Access Provider and the applicant/user. There may be one or more Access Managers (AMs) per Access Provider. See also "Liaison Officer".

Access Provider
The organisation where the TA project is performed. Sometimes referred to as "Host".

Access Provider's facility
The premises and the platforms of the Access Provider where the TA project is performed. Sometimes simply referred to as "facility", "service-providing facility", "access-providing facility" or "host facility".

Home institution
The Applicant's institute of affiliation; the legal entity responsible for the applicant.

Hosting Agreement
The legal agreement between the Home Institution of the User and the institution of the Access Provider in which the Terms and conditions for the access are specified. May also be referred to as User Access Contract.

Liaison Officer
This term might sometimes be used synonymously with Access Manager.

On-site Access
A type of access for which the User or User group visits the Access Provider (on site) to carry out a research project.

Remote Access
A type of access in which the service is delivered without the User visiting the Access Provider e.g., procurement and dispatching of field samples, organisms and their derivatives, or culture strains and their derivatives.

Transnational Access (TA)
Provision of access (by an Access Provider) to a User or User group whose home institution is located in a country other than the country where the Access Provider is located.

User Selection Panel (USP)
The group of experts in charge of approving or rejecting applications after they have gone through scientific review. The User Selection Panel comprises the AQUASERV Executive Committee and the external Scientific and Technical Advisory Board (STAB).

A2. Overview table of facilities, installations, and contacts

The table below provides an overview of the units of access per installation and the responsible Access Manager for each facility. This information shall be used by applicants with the support of the Access Manager to make a rough cost estimation for their TA project.

Note: ***Facility*** corresponds to the entities in the service catalogue as featured in the application system on ARIA. Facilities may in some cases be further divided into ***installations***, however, this is for internal budgeting purposes and not of further consequence to the applicant/user.

Country code	*Facility*	*Installation*	*Unit of access*	*Access Manager*	*Email*
PT	CCMAR	CCMAR-Platforms	user/day	Ana Amaral	ccmarassemble@ualg.pt
PT	CCMAR	CCMAR-Ramalhete	tank/week	Ana Amaral	ccmarassemble@ualg.pt
PT	CCMAR	CCMAR-Boats	user_group/day	Ana Amaral	ccmarassemble@ualg.pt
PT	CCMAR	CCMAR-Diving	user_group/day	Ana Amaral	ccmarassemble@ualg.pt
PT	CCMAR	CCMAR-Telemetry	user_group/day	Ana Amaral	ccmarassemble@ualg.pt
PT	CIIMAR	CIIMAR-Aquaculture	tank/day	Carla Domingues, Ana Cavadas	ciimarembrc@ciimar.up.pt
PT	CIIMAR	CIIMAR-Labs&Platforms	user/day	Carla Domingues, Ana Cavadas	ciimarembrc@ciimar.up.pt
PT	CIIMAR	CIIMAR-Ecosystem	user_group/day	Carla Domingues, Ana Cavadas	ciimarembrc@ciimar.up.pt
PT	ACOI	ACOI-Labs&Platforms	user/day	Mariana Assunção	mariana.assuncao@uc.pt
FR	CNRS-METATRON	CNRS-METATRON	*under revision, please ask Access Manager*	Simon Blanchet, Murielle Richard	simon.blanchet@sete.cnrs.fr, murielle.richard@sete.cnrs.fr
FR	CNRS-PLANAQUA	CNRS-PLANAQUA	mesocosm/week	Jean-François Le Galliard, Beatriz Decencière	cereep@bio.ens.psl.eu, beatriz.decenciere@bio.ens.psl.eu
IT	SZN	SZN	user/day	Pasquale De Luca	pasquale.deluca@szn.it
GR	HCMR	HCMR-AQUALABS	tank unit/week	Stavros Chatzifotis	stavros@hcmr.gr
GR	HCMR	HCMR-ECO	user_group/day	Costas Tsigenopoulos,	tsigeno@hcmr.gr, thanosd@hcmr.gr

				Thanos Dailianis	
GR	HCMR	HCMR-BIOGEN	user group/week	Costas Tsigenopoulos, Panagiotis Kasapidis	tsigeno@hcmr.gr, kasapidi@hcmr.gr
GR	HCMR	HCMR-HPC	core/hour	Costas Tsigenopoulos, Antonis Potirakis	tsigeno@hcmr.gr, potant@hcmr.gr
IT	UNITO-AQUA	UNITO-AQUA	tank/week	Laura Gasco, Ilaria Biasato	laura.gasco@unito.it, ilaria.biasato@unito.it
IT	UNITO-INSECTS	UNITO-INSECTS	rearing box/week	Laura Gasco, Ilaria Biasato	laura.gasco@unito.it, ilaria.biasato@unito.it
FI	LUKE-Enonkoski	LUKE-Enonkoski	m2/week	Antti Kause	antti.kause@luke.fi
FI	LUKE-SelBreed	LUKE-SelBreed	user group/week	Antti Kause	antti.kause@luke.fi
FI	LUKE-LARS	LUKE-LARS	RAS/week	Antti Kause	antti.kause@luke.fi
FI	LUKE-PMRS	LUKE-PMRS	user group/week	Antti Kause	antti.kause@luke.fi
FI	LUKE-FINFARMGIS	LUKE-FINFARMGIS	user/days	Antti Kause	antti.kause@luke.fi
FI	LUKE-Otolab	LUKE-Otolab	200 samples/week	Antti Kause	antti.kause@luke.fi
CZ	JU-ICS	JU-ICS	user group/week	Petr Císař	cisar@frov.jcu.cz, jmraz@frov.jcu.cz, omalinovskyi@frov.jcu.cz, vkaspar@frov.jcu.cz, piackova@frov.jcu.cz
CZ	JU-IAPW	JU-IAPW	user group/week	Jan Mráz	jmraz@frov.jcu.cz
CZ	JU-IFA	JU-IFA	user group/week	Oleksandr Malinovskyi	omalinovskyi@frov.jcu.cz
CZ	JU-GRC	JU-GRC	user group/week	Vojtěch Kašpar	vkaspar@frov.jcu.cz
CZ	JU-LIFD	JU-LIFD	user group/week	Veronika Piačková	piackova@frov.jcu.cz
FR	IMEV	IMEV	person/day	Nathalie Turque, Julien Lopez-Pardo	nathalie.turque@embrc-france.fr, julien.lopez-pardo@imev-mer.fr
FR	OOB	OOB	person/day	Nathalie Turque, Julie Boeuf	nathalie.turque@embrc-france.fr, julie.boeuf@obs-banyuls.fr
FR	SBR	SBR	person/day	Nathalie Turque, Cécile Cabresin	nathalie.turque@embrc-france.fr , cecile.cabresin@sb-roscoff.fr
FR	IFREMER-MET	IFREMER-MET	m2/week	Christophe Stavrakakis	christophe.stavrakakis@ifremer.fr
FR	IFREMER-MEB	IFREMER-MEB	m2/week	Christophe Stavrakakis	christophe.stavrakakis@ifremer.fr

FR	IFREMER-PEMP	IFREMER-PEMP	m3/month	Marie-Laure Begout	marie.laure.begout@ifremer.fr
FR	IFREMER-BMSA	IFREMER-BMSA	room/week	Fabrice Pernet	fabrice.pernet@ifremer.fr
FR	IFREMER-FMSP	IFREMER-FMSP	room/day	Fabrice Pernet	fabrice.pernet@ifremer.fr
FR	INRAE-IERP	INRAE-IERP	circuit/week	Dimitri Rigaudeau, Christelle Langevin	dimitri.rigaudeau@inrae.fr, christelle.langevin@inrae.fr
FR	INRAE-LPGP	INRAE-LPGP	tank/week	Jean-Charles Gabillard, Brigitte Guillet	jean-charles.gabillard@inrae.fr, brigitte.guillet@inrae.fr
FR	INRAE-STPEE	INRAE-STPEE	tank/week	Stéphane Panserat	stephane.panserat@inrae.fr
FR	INRAE-PEIMA	INRAE-PEIMA	tank/week	Nicolas Larranaga	nicolas.larranaga@inrae.fr
FR	UL_EPA	UL-EPA	RAS/week	Sylvain Milla	sylvain.milla@univ-lorraine.fr
NL	WR	WR	system/week	Wout Abbink	wout.abbink@wur.nl
ES	ULPGC	ULPGC-WWSSU	tank/week	Rafael Ginés, Daniel Montero	rafael.gines@ulpgc.es, daniel.montero@ulpgc.es
ES	ULPGC	ULPGC-MBS	tank/week	Rafael Ginés, Daniel Montero	rafael.gines@ulpgc.es, daniel.montero@ulpgc.es
ES	ULPGC	ULPGC-FITU	tank/week	Rafael Ginés, Daniel Montero	rafael.gines@ulpgc.es, daniel.montero@ulpgc.es
NO	UiB	UiB	person/day	Rannveig Myklebust	rannveig.myklebust@uib.no
NO	NTNU	NTNU	person/hour	Inger Jennings, Kjell Inge Reitan	inger.m.jennings@ntnu.no, kjell.i.reitan@ntnu.no
DK	DTU	DTU-AAH	system/day	Argelia Cuenca, Jacob Schmidt	arcun@aqua.dtu.dk, jacsc@aqua.dtu.dk
ES	CSIC-IATS-EXP	CSIC-IATS-EXP	person/week	Josep Calduch-Giner	j.calduch@csic.es
ES	CSIC-IATS-ANA	CSIC-IATS-ANA	person/week	Josep Calduch-Giner	j.calduch@csic.es
ES	CSIC-IEO-ICAR-MAP	CSIC-IEO-ICAR-MAP	person/week	Aurelio Ortega García	aurelio.ortega@ieo.csic.es
SE	UMEA	UMEA	person/day	Regina Kolzenburg	regina.kolzenburg@umu.se
SE	UGOT-TML	UGOT-TML	person/day	Marina Antonina Zoe Panova, Anna Berggren	marina.panova@marine.gu.se, anna.berggren@bioenv.gu.se
SE	UGOT-KMRS	UGOT-KMRS	person/day	Sam Dupont, Andrea Norder, Linus Hammar Perry, Simon Ungman Hain	sam.dupont@bioenv.gu.se, andrea.norder@gu.se, linus.hammar@gu.se, simon.ungman.hain@gu.se

ES	ECIMAT-UVIGO	UVIGO-ECIMAT	person/day	Maria Huete Ortega	maria.huete@uvigo.gal
ES	ECIMAT-UVIGO	UVIGO-PHYTOFISH	person/day	Maria Huete Ortega	maria.huete@uvigo.gal
ES	ECIMAT-UVIGO	UVIGO-Comparative Genomics	person/day	Maria Huete Ortega	maria.huete@uvigo.gal
ES	PiE-UPV/EHU	PiE-UPV/EHU	person/day	Xabier Lekube	xabier.lecube@ehu.eus
IT	UNINA	UNINA-FASQ	sample	Paola Adamo, Nidhi Dalal	paola.adamo@unina.it, nidhi.dalal@unina.it
PT	INSA	INSA	user/day	Inês Coelho, Inês Delgado	ines.coelho@insa.min-saude.pt, ines.delgado@insa.min-saude.pt
TR	TUBITAK	TUBITAK	user/day	Elif Yener	elif.yener@tubitak.gov.tr
SI	JSI	JSI-AnalLab	user/day	Nives Ogrinc, Vanja Usenik	nives.ogrinc@ijs.si, vanja.usenik@ijs.si
BE	UGENT	UGENT-ARC	user/week	Marleen Roelofs, Vincent Vermeylen	marleen.roelofs@ugent.be, vincent.vermeylen@ugent.be
BE	UGENT	UGENT-Phycology	user/week	Marleen Roelofs, Olivier De Clerck	marleen.roelofs@ugent.be, olivier.declerck@ugent.be
BE	RBINS	RBINS	user/day	Jan Vanaverbeke, Wannes De Clercq	jvanaverbeke@naturalsciences.be, wdeclercq@naturalsciences.be
PT	IPMA	IPMA	user/day	Narcisa Bandarra, Helena Lourenço	narcisa@ipma.pt, helena@ipma.pt
NO	IMR	IMR-Austevoll	tank/week	Prescilla Perrichon	prescilla.perrichon@hi.no
NO	IMR	IMR-Matre	tank/week	Prescilla Perrichon	prescilla.perrichon@hi.no
UK	USTIR_MERL	USTIR-MERL	system/week	Sonia Rey Planellas, Sushee Dunn	sonia.reyplanellas@stir.ac.uk, sushee.dunn@stir.ac.uk
UK	USTIR_NBFRU	USTIR-NBFRU	system/week	Sonia Rey Planellas, Sushee Dunn	sonia.reyplanellas@stir.ac.uk, sushee.dunn@stir.ac.uk
HU	MATE_POND	MATE-POND	ha/week	Jelena Stanivuk	stanivuk.jelena@uni-mate.hu
HU	MATE_RAS	MATE-RAS	system/week	Jelena Stanivuk	stanivuk.jelena@uni-mate.hu
HU	MATE_NUTRI	MATE-NUTRI	system/week	Jelena Stanivuk	stanivuk.jelena@uni-mate.hu
HU	MATE_DANIO	MATE-DANIO	lab/week	Jelena Stanivuk	stanivuk.jelena@uni-mate.hu
HU	MATE_GENO	MATE-GENO	lab/week	Jelena Stanivuk	stanivuk.jelena@uni-mate.hu
HU	MATE_CBL	MATE-CBL	lab/week	Jelena Stanivuk	stanivuk.jelena@uni-mate.hu