



ASSEMBLE Report Summary

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Final Report Summary - ASSEMBLE (Association of European Marine Biological Laboratories)

Executive Summary:

The marine biological laboratories need to adapt to the constant progress in biology, as shown in particular by the onset of comparative, functional and ecological genomics in marine sciences. Novel biological and ecological models are emerging, which need to be provided in various forms to a steadily increasing community, including to scientists who are not residents of marine laboratories. ASSEMBLE provides this in an efficient and coordinated way. The seas also become increasingly important as a resource at all levels, from novel compounds to ecosystem value and services. In this context, changes such as global warming and ocean acidification as well as the increased pressure on the marine biological resources are becoming vitally important issues. The ASSEMBLE network, which eases access to different but complementary ecosystems, and is hence of strategic importance to tackle these questions at a regional scale. ASSEMBLE has developed into an integrated infrastructure that optimises the possibilities for biologists in Europe to conduct excellent research on marine ecosystems and biological models using the most advanced approaches in modern biology.

The fundamental objectives of ASSEMBLE are to:

- Enhance transnational access to a set of state-of-the-art European infrastructures for marine biology and ecology;
- Improve these infrastructures along their areas of excellence in biology and ecology, with an emphasis on the increased provision of marine model organisms, including established as well as emerging systems for marine genomics;
- Enhance complementarity and interoperability within the consortium and with similar marine bioresource centres abroad;
- Create a European Marine Biological Resources Centre, with the aim of providing the scientific community of Europe with integrated and sustainable access to a representative set of unique coastal environments and model organisms

Project Context and Objectives:

ASSEMBLE will create a network of leading marine biological research stations around the European coastline, that collectively will provide access to a comprehensive set of marine ecosystems and to a wide variety of marine model organisms, including an increasing variety of experimental systems amenable to state-of-the-art genomics and proteomics approaches (see Tables 2 & 3). Subsidiarity between partners will allow for the back-up of one partner's system by one or more of the other partners, thus ensuring a more regular supply of biological models.

We aim to develop an integrated infrastructure that will optimise the possibilities for biologists in Europe to conduct excellent research on marine ecosystems and biological models using the most advanced approaches in modern biology.

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- Improve these infrastructures along their areas of excellence in biology and ecology, with an emphasis on the increased provision of marine model organisms, including established as well as emerging systems for marine genomics (see Table 3);
- Enhance complementarity and interoperability within the consortium and with similar marine bioresource centres abroad;
- Create a European Marine Biological Resources Centre, with the aim of providing the scientific community of Europe with integrated and sustainable access to a representative set of unique coastal environments and model organisms.

The marine biological laboratories need to adapt to the constant progress in biology, as shown in particular by the onset of comparative, functional and ecological genomics in marine sciences. Novel biological and ecological models are emerging, which need to be provided in various forms to a steadily increasing community, including to scientists who are not residents of marine laboratories. ASSEMBLE will provide this in an efficient and coordinated way. The seas also become increasingly important as a resource at all levels, from novel compounds to ecosystem value and services. In this context, changes such as global warming and ocean acidification as well as the increased pressure on the marine biological resources are becoming vitally important issues. The ASSEMBLE network, which represents different but complementary ecosystems, will be of strategic importance to tackle these questions at a regional scale.

The current baseline is that the marine laboratories in the ASSEMBLE consortium independently act as research infrastructures for transnational access by individually providing access to fully equipped research laboratories next to coastal ecosystems and by supplying living organisms (see Table 1 in section 2.3). Until this ASSEMBLE project no group of marine stations has directly focussed on working towards an optimal European resource so there is a clear need for cooperation, better inter-operability, and higher visibility in Europe. Coordination of a new breed of marine research stations is essential, developing and applying new technologies and facilities that allow a higher quality of service, not only for the benefit of the marine biology community, but also of the increasing numbers of scientists that are turning to marine organisms as models with which to investigate fundamental questions in biology and related disciplines.

As a European Integrated Activity ASSEMBLE will markedly improve the quality of the distributed infrastructure as a whole, through common initiatives such as those listed below. This will be in synergy with the improvements planned by the individual partners for their respective infrastructures.

- rationalisation of the procedures to provide marine models either on-site or remotely;
- better inter-operability and higher complementarity in model availability;
- enhanced visibility in Europe and abroad, and capacity to establish links with similar infrastructures worldwide.

As stated above, there are few existing collaborations between the partners of this application at the infrastructure level and, until now, none has been directly focussed on working towards an optimal pan-European structure.

Thus a very important long-term objective of joining the forces of European marine coastal research into ASSEMBLE is to work towards creating a sustainable integrated European infrastructure for state-of-the-art provision of access to marine biological models, which we refer to as the European Marine Biological Resource Centre (EMBRC). A measure of a success of this objective would be the inclusion of such a marine biological resource centre on the revised ESFRI Roadmap. Another important aspect will be to convince national science policy makers that they should support ASSEMBLE as a unique infrastructure and recognise that it requires constant upgrading to keep up with scientific progress.

Networking will primarily aim at de-fragmenting this set of infrastructures, particularly at the level of the technical staff. This includes activities to create a coherent programme and long-term sustainable support for improving the supply (quality and quantity) of marine models species for biological and ecological research (see 1.2.5 for details and table 3 for current list of models). Progress will be measured by increase in the quality and number of operational culture facilities for current and new models across the network.

Networking comprises two work-packages; the first will be on “Optimizing protocols and ensuring inter-operability” (WP2) and the second on the “Unified access to resources” (WP3).

In WP2 internal networking will accelerate the sharing of individual experience (e.g., UGOT in transnational access under the former FP6 Integrative Infrastructure Initiative model, SAMS in remote access to its algal collection, SBR in external access to genomics platforms, SZN in its culture facilities, etc.). Measures of success will include completion of the deliverables for this WP.

The core of WP3 will be to network the individual members’ data bases into a general, one-stop-shop portal in order to increase the visibility of the infrastructure and to facilitate access, both for visiting scientists and for requests for shipments of materials. The data-base will be one important part that will anchor ASSEMBLE in the community of marine biologists in Europe and abroad. This action also is essential for dissemination towards other potential stakeholders such as private companies. We expect that increased awareness to this unique resource will raise the profile of marine organisms for the discovery of novel compounds and bio-processes. Also, these activities should facilitate outreach in the direction of Third Countries. Integration at this level is a prerequisite to the implementation of a genomic resource centre as no such common service currently exists, even at the level of any individual ASSEMBLE member. Measures of success will include completion of the deliverables for this WP.

As specified in WPs 4-12, all of the marine laboratories in ASSEMBLE will offer access to their marine environmental sites and to fully equipped research laboratories. It is this combination which makes ASSEMBLE a remarkable distributed infrastructure, unique by its specificity, its importance and its impact and clearly of European importance by its dimension.

The starting point is the level of access each site provides currently. Progress will be measured by increases in number of access days and shipments, particularly the number of new users and currently underrepresented user groups. It will also include a measure of the quality of the scientific output including the number of publications acknowledging the ASSEMBLE programme.

The joint research activities of ASSEMBLE are designed to improve what is probably the most emblematic service of this research infrastructure, that is, the production, the maintenance and the provision of biological and/or ecological models, with an emphasis on models for marine genomics.

A list of the latter models, which are graded as existing, emerging and potential according to the extent of the genomic data already available, is provided in Table 3 (page 74). The other criteria which were taken into account to settle on common models are: biological (e.g., evolutionary), ecological or economical significance; amenability to cultivation; impact on the community, within the consortium and beyond; and availability of biological tools, such as amenability to

sexual or asexual propagation. This list, however, is by no means exhaustive and ASSEMBLE has built in flexibility to respond to other requests. One may even expect that this opportunity will act as a pipe-line to accelerate the development of presently un-predicted experimental systems but for which demand will arise in the life-time of this project. Progress will be measured by increase in the quality and number of operational culture facilities for current and new models across the network.

In this light JRAs in ASSEMBLE will include: 1) improving the provision of whole, multi-cellular organisms (WP13), with such activities as tank development, flow control, filtration and containment, feeding, breeding, and distribution of marine plants and animals; 2) improving the provision of unicellular eukaryotic organisms and cell lines (WP14), with such activities as development of cell lines, development of techniques for cryopreservation. It is noteworthy here that bacteria and archaea are not included in order to avoid possible redundancy with the top-down target under the call INFRA -2008-1.1.2.9. And 3) improving the provision of genetic and molecular resources (WP15), with such activities as the development of mutant lines. Measures of success will include completion of the deliverables for these WPs.

Traditionally, marine research stations have acted as bases for the provision of living marine organisms for research and teaching, as well as for access to specific environments for ecosystem level research. In addition, they have provided laboratory facilities for on site analyses and experimentation using fresh material, largely by resident scientists but also with a long tradition of hosting visiting scientists, often working in collaboration with the residents. Much of this research requires specialised infrastructure such as controlled seawater systems and indoor and outdoor experimental structures including mesocosms and ecotrons, as well as state-of-the-art analytical equipment and expertise for advanced laboratory analyses. It is this dual expertise of 'provision and research' that comprises the core of the TA component of ASSEMBLE (see WPs 4-12). European consortium members were chosen on the basis of the diversity of access types offered (including ecosystem diversity) and the complementarity of technical and research specialities. These marine laboratories are located in prime coastal sites, many of which are marine reserves, where the source of experimental material is literally on the doorstep. The sites are distributed from northern Europe to the Atlantic and Mediterranean and as such offer access to the complete range of European coastal marine ecosystems. One partner from Israel (WP10) and one partner from Chile (WP11) were also invited into ASSEMBLE because they share with the European partners a common attitude towards the development of marine biology and because their inclusion considerably expands the range of unique ecosystems and models. By virtue of the common ASSEMBLE website (see Management) the assembled TAs comprise a "one stop shop" for access. This will allow members of the research community and other user-groups access, in a single operation, to a complete range of coastal sites and state-of-the-art marine biological research infrastructures and to the genomic resource centre.

In addition to location, each infrastructure site has its own speciality and expertise, including unique access to biological systems for functional exploration. As the demand for provision of model species for genomics is increasing, there is an increasing need to both improve technologies and methodologies and to spread these to other sites. Thus, the JRAs of ASSEMBLE were designed to quantitatively and qualitatively improve our capacities for distributing marine resources to the wider research community. Since these tasks require specific knowledge which depends on whether these models are genetic or molecular resources (WP15), protists or cell lines (WP14), pluricellular algae, classical animal models, or emerging models (WP13), they are addressed by three different JRAs. Yet, they share common issues, related, for example, to containment, long-term preservation methods, or to shipping of these models across national borders, integrating these activities together. The program of JRAs was designed so that developments in the activities pertaining to the provision of marine models at one site can be efficiently transferred to other locations. The technical staff who currently run these infrastructures will be largely and collectively engaged in this research and in the networking for inter-operability (WP2), ensuring that the results will be applicable and sustained throughout the consortium. Nevertheless, the partners of ASSEMBLE are well aware that while it will be part of our good practice to provide "back-up" resources, it would be meaningless and even risky to fully duplicate expertise across all partners. Very much like in advanced terrestrial research, where one cannot expect to build greenhouses for transgenic plants, resource centres with knock-out mouse lines or DNA stock centres in many different locations, marine resource centres will have to specialize in their areas of excellence while coordinating their technological upgrading.

Project Results:

ASSEMBLE seeks to provide an integrated service to the science community, with access to a high diversity of ecosystems – from Nordic Fjords to sub-tropical (Israel) and Pacific (Chile) – as well as concerted, reliable, guaranteed quality of provision of marine experimental models across the whole of Europe. For reasons that are biological (access to a set of biologically and / or ecologically relevant models) and practical (historical fragmentation of expertise amongst the different marine laboratories), this coverage cannot be undertaken without a concerted effort from an association of marine laboratories (together with scientists in biology, chemistry, computing sciences, etc.), a European approach which only ASSEMBLE can provide.

Through ASSEMBLE, the infrastructures commit to a common agenda to coordinate access to facilities and to a comprehensive range of ecosystems, and to harmonize and invest more efforts into the husbandry of model marine organism, especially those for which demand is expected to increase because of their amenability to genomic approaches. This will result in a higher and more concerted awareness of the need to maintain the marine station facilities and techniques at the state-of-the-art level.

ASSEMBLE laboratories are providing coordinated and quality access to "non-conventional" (i.e., non-terrestrial) models that are needed to provide the wide coverage of the tree of eukaryotic life that is essential for developing an understanding of the evolution of biological systems. This is important not only for our colleagues in inland laboratories

who use marine models, but also to constantly bring to the marine laboratories expertise and interactions with other fields of science, a vital policy for sustaining their excellence in research.

ASSEMBLE is providing extensive opportunities for interactions between users and resident researchers. In particular, the implementation of a marine genomic resources centre will have clear structuring and catalytic effects and will markedly expand the scope of marine models.

ASSEMBLE aims at providing the framework and European dimension for increasing interactions between researchers and industry, notably in view of the sustainable use of marine biological resources (fisheries and aquaculture) and of their biotechnological exploitation (active bio-molecules and bio-processes).

Potential Impact:

Impact

Strategic impact

How ASSEMBLE will contribute towards the expected impacts of this integrating activity.

(1) ASSEMBLE will federate into a single, distributed infrastructure 6 of the largest and most high profile European coastal marine biological stations, together with comparable structures in Israel and Chile, as well as one of the leading European molecular genetics laboratories. ASSEMBLE institutes host ca. 700 resident staff and the total operating costs of ASSEMBLE consortium members amounts to ca. 27 million € annually. Through ASSEMBLE, these infrastructures commit to a common agenda to coordinate access to facilities and to a comprehensive range of ecosystems, and to harmonize and invest more efforts into the husbandry of model marine organisms, especially those for which demand is expected to increase because of their amenability to genomic approaches. This will result in a higher and more concerted awareness of the need to maintain the marine station facilities and techniques at the state-of-the-art.

(2) ASSEMBLE will provide ca. 58 person years of Transnational Access to external users. Investment in outreach will promote access to a wide range of existing and new user communities. Clear and major improvements will be the collective implementation of (i) a unified and user-friendly point of access for information on facilities, resources and protocols, and (ii) common procedures for the deposition and the selection of projects relating to access. ASSEMBLE will catalyse cutting-edge life sciences research by providing access to sophisticated laboratories close to the sea, which ensures immediate access to biological material and the knowledge base for culturing and maintaining organisms in the best possible conditions. The quantity and quality of biological resources and the quality of the knowledge base essential for exploitation of these resources will be significantly enhanced through the joint research activities of ASSEMBLE.

(3) ASSEMBLE laboratories will provide coordinated and quality access to “non-conventional” (i.e., non-terrestrial) models that are needed to provide the wide coverage of the tree of eukaryotic life that is essential for developing an understanding of the evolution of biological systems. This is important not only for our colleagues in inland laboratories who use marine models (for example at such high profile centres of excellence as the European Molecular Biology Laboratory which has sites in Grenoble, Hamburg, Heidelberg, Hinxton and Rome), but also to constantly bring to the marine laboratories expertise and interactions with other fields of science, a vital policy for sustaining their excellence in research.

(4) ASSEMBLE will provide extensive opportunities for interactions between users and resident researchers. In particular, the implementation of a marine genomic resources centre will have clear structuring and catalytic effects and will markedly expand the scope of marine models. Through ASSEMBLE marine biologists will then be in a position to better contribute to the wider advancement of science and to promote the movement towards systems biology. Knowledge and technology transfer between TAs and JRAs of ASSEMBLE will promote flexibility of technological systems and methodologies for maintenance of marine models, significantly increasing the European-level capacity to adapt to future changes in demand and the introduction of new model organisms.

(5) ASSEMBLE will provide the framework and European dimension for increasing interactions between researchers and industry, notably in view of the sustainable use of marine biological resources (fisheries and aquaculture) and of their biotechnological exploitation (active bio-molecules and bio-processes).

Steps that are needed to bring about these impacts.

(1) Formulation and ratification of the Consortium Agreement; Formation of the Project Implementation Committee; Formation of the management office; Implementation of Networking activities; Implementation of Joint Research activities; Strategic planning and lobbying by the coordinators.

(2) Development and harmonization of resource data-bases; Implementation and updating of common web portal; Selection and implementation of User Selection Panels; Implementation of policy for coordinating and monitoring access; Conducting joint research; Definition of Best Practice Guidelines; Creation of virtual tool-box; Implementation of intranet and videoconferences for knowledge and technology transfer between consortium institutes (technical staff and researchers); Implementation of outreach activities.

(3) Implementation of Transnational Access activities; Organisation of thematic workshops on services and techniques for ASSEMBLE partners and external participants; Implementation of mechanisms for information flow within the network and between access providers and users;

(4) Access to common data-bases on the ASSEMBLE web portal; Harmonisation and improvement of technologies and methodologies for husbandry of marine models; Implementation of mechanisms for knowledge and technology transfer between consortium institutes (technical staff and researchers); Monitoring of scientific trends with respect to marine models; Processing and organisation of molecular resources; Joint research on genetic transformation techniques; Creation of a data-base for information associated with molecular resources; Visibility on the common web portal and outreach.

The structuring impact of ASSEMBLE will be monitored within the project life-time through defined parameters, including:

(i) comparison of the amount of transnational access to the ASSEMBLE partners before the creation of the network, at

mid-term and shortly after the end of the project; (ii) clearly identifiable and measurable technical improvements to the infrastructures and to the technologies selected for the JRAs, in the form of new prototypes and procedures; (iii) adoption of common procedures, transfer of knowledge between the ASSEMBLE staff members particularly the technical support staff involved directly in the provision of access; (iv) the number and impact factor of publications arising from the programme; (v) commitment from research funding agencies for a sustained support to their national contributors to a European Resource Centre for Marine Sciences.

Need for a European (rather than national) approach.

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Relations to other national or international activities.

All marine partners in this application are members of the MARS network of Marine Stations as well as active members of the NoEs Marine Genomics Europe and MarBEF, and the present proposal is a natural development from these networks. This means that, in time, the good practice and inter-operability which will be derived from ASSEMBLE can be spread throughout Europe, especially to emerging member states where marine laboratories are present.

As an example of the strategic position of ASSEMBLE in marine ecological and environmental issues, it is notable that a recent European Science Foundation Strategic Workshop (Gran Canaria, January 2008) on Impacts of Ocean Acidification (OA) formulated a policy document that identifies coastal marine laboratories as key players in the development of a European research response to OA. Here the infrastructure and knowledge provided by coastal marine research laboratories will be vital and model organisms will be invaluable tools for this research which spans the disciplines of biology, chemistry, physical oceanography and atmosphere sciences, and modelling.

ASSEMBLE is also part of a larger endeavour to capitalize on the dynamics of the NoEs Marine Genomics Europe and MarBEF, both of which end in 2008.

- Firstly, we have undertaken to establish an international PhD programme in marine systems biology and biodiversity in order to attract more talented young researchers into the field of marine biology and ecology and to train the young scientists who will be future users of our network of infrastructures. The stakeholders of this programme consist of those research teams and students who are interested in the application of genomics and post genomics approaches, including systems biology in marine biology, ecology, biotechnology, and aquaculture. They will rely heavily on the ASSEMBLE infrastructures for training and research. Formal commitments for the earmarking of PhD fellowships into this international programme have already been obtained from France, Italy, Portugal and Chile.

- Secondly, our long-term objective of creating an integrated pan-European infrastructure must be developed in a dialogue with policy makers. As already mentioned above, we have started lobbying our ESFRI national representatives, notably in the Biomedical Sciences and the Environment committees, for inclusion in the ESFRI road map. This would enhance coordination at the level of capital investments and throughout the ERA, and with the added goal of promoting science parks next to the marine stations. In addition, by providing high quality access to the main sites where coastal biodiversity is monitored, this potential development of ASSEMBLE would strengthen “Lifewatch”, a preparatory ESFRI project which is designed to harmonize and harness the distributed data for marine and terrestrial biodiversity. To support this aim we will devote effort to keeping policy makers informed of the advances achieved by the ASSEMBLE programme. The ASSEMBLE PIC will actively participate in discussions concerning future strategies for supporting European-scale marine coastal infrastructure. As this distributed infrastructure must be optimized to serve all members of the European science community on equal terms, including those from new and aspiring member states, discussions will include the integration of key players in marine biology and ecology who are not members of ASSEMBLE. Hence ASSEMBLE will represent a milestone in the triangle of research infrastructures, people and programs, as well as in the knowledge triangle of research, education and innovation.

Assumptions and external factors that may affect impact achievement.

The main assumption driving this proposal is that access to the main European marine laboratories will continue to elicit interest from the science community. During preparation of this application, and indeed in the last several years, all members of the consortium have received numerous expressions of interest and support from prospective visitors and not only from on-going collaborations within the ASSEMBLE partnership. These external enquiries come not only from marine biologists, but also from geologists, geographers, medical researchers and economists. Together we have received enquiries concerning access from several hundred scientists world-wide. The majority is from European states, but many also emanate from eastern states such as Russia and Ukraine. Further afield, there is significant interest and support from the USA, Canada, Australia, and Japan. Indeed, as pointed out elsewhere, colleagues from the USA and Japan have expressed great admiration for our advanced thinking with regard to marine infrastructure access. In this respect, it is important to note that the amount of on-site access we propose to provide under the current proposal is less than the overall access that will be provided during the project lifetime. In other words, it is clear that demand will far exceed the amount we can offer, again reflecting the widespread interest in such an access programme. Much of this interest stems from previous access schemes as well as the very strong regional, national and international links the ASSEMBLE partners have with a wide range of other organisations including universities and other marine laboratories. This will naturally extend the impact of the integrated infrastructure far beyond that of the individual laboratories themselves. Thus, by acting as foci in a widespread international network, they will provide significant added value to the infrastructure.

Plan for the use and dissemination of foreground

Dissemination actions

Dissemination of ASSEMBLE to the potential users in the research community and to all other stakeholders interested

in the issues addressed by this Integrated Infrastructure will be primarily addressed in the common web site. Through this site ASSEMBLE intends to: (i) provide general information about the Integrated Infrastructure as well as detailed information on each Transnational Activity; (ii) provide common recruitment and selection protocols for access to the different TAs; (iii) communicate ASSEMBLE activities and findings (see Section 2 for details). In addition, the ASSEMBLE website will contain sections providing information on the individual infrastructures and a general overview of the project itself. The content of this site will be dedicated to attracting students to marine biology as well as to science in general. The following complementary actions will also be undertaken:

- Facilitating scientific communication and collaboration: Both scientists inside the consortium and the science community outside will be targeted. For the former, the following actions will be carried out: (i) implementation of an intranet platform (ii) regular workshops and videoconference meetings (see management and networking). Potential users will be made further aware of access possibilities offered by: (i) presenting posters and distributing leaflets on the project at national and international scientific meetings, workshops and conferences; (ii) directly contacting potential users identified by the outreach officer, notably with biotechnology R&D departments; (iii) requesting acknowledgements to ASSEMBLE from its external users in their related communications and publications.
- Increasing awareness and information of general public: Historically, marine stations were the first to open aquaria to put their local fauna and flora on display for the general public. Even though a number of commercial aquariums have been created with the development of tourism, marine laboratories still have a key role in raising public awareness about marine biodiversity and the various threats it faces, such as overharvesting, pollution and global climate change. Four of the ASSEMBLE partners maintain aquaria and/or organize guided visits of their installations, and ECIM is planning to open a public facility, notably for the benefit of local fishermen (Table 1). These are useful instruments for dissemination and this project is an excellent opportunity to increase their outreach towards the general public. Introductory posters and/or pamphlets about ASSEMBLE will be made available to explain to the general public why it is important to maintain these infrastructures and future orientation.
- Increasing awareness and implication of stakeholders: Local political bodies are too often unaware of the potential of marine laboratories in terms of science, education and innovation. Again ASSEMBLE will provide an excellent opportunity to raise awareness. Whenever appropriate we will associate these stakeholders in the dissemination of the project aims and results to secure their support.

Intellectual Property Rights (IPR) Management

At the consortium level, a Consortium Agreement will be negotiated and signed between all partners. It will follow the rules indicated in the Rules for Participation in FP7, but also the provisions of the Grant Agreement, with a special clause for the provision of Transnational Access. The Consortium Agreement will define all rules on publications, the background needed for the project, but also the access rights to the foreground, and rules in case of joint ownership. As soon as the negotiation stage starts, the different partners will be asked to identify which background they want to exclude from the project.

At the individual infrastructure level, IPR issues mainly stem from the fact that external users will be using the ASSEMBLE facilities. These visitors will be subject to the internal regulations of the institutions on, for example, confidentiality aspects. To protect the rights of both the users and the infrastructures, rules of access will be established for each partner, yet with an overall coherence and with the understanding that these rules should not hinder attractiveness to users, as this is the core of the project. These will depend on the modalities of access, either collaborative or independent. In the latter case, it is not expected that services provided will generate IPR for the hosting institution when access is fully funded by ASSEMBLE. The only exception concerns discoveries based on undisclosed biological resources belonging to the hosting institution (mainly relating to the remote provision of cells and DNA clones). This will be dealt with by the signature of material transfer agreements.

List of Websites:

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Related information

Result In Brief

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