WWW.MARINEBIOTECH.EU

info@marinebiotech.eu

Map of Tech-Transfer Practice and Policy

Work Package 3

Interactions with industry

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Authors:
Lýður Skúli Erlendsson The Icelandic Centre for Research (RANNIS), Iceland
Sigurður Björnsson The Icelandic Centre for Research (RANNIS), Iceland
Torger Børresen Innovation Fund Denmark (IFD), Denmark

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EXECUTIVE SUMMARY

This report presents results from deliverable D3.3, which constitutes a part of Task 3.1, WP3. Two actions have been performed for gathering opinions on the technology transfer best practice across Europe. The first was to include a set of questions in the survey made by ERA-MBT during the summer of 2014, which is reported separately, and the second was questions presented at the stakeholder meeting in Lisbon 28-29 October 2014. The results from both actions as far as technology transfer is concerned, are presented in this delivery report.

For a successful technology transfer practice access to infrastructure and tools may become limiting factors in the process. Thus some questions of these aspects were included in the ERA-MBT survey.

The results reported are compared with a comparable survey made by DG MARE early 2014.

The ERA-MBT survey found that the main barriers to successful technology transfer from research to industry was level of public funding to bridge the gap between academia and industry and insufficient cooperation between academia and industry. Most of the arguments stated in the DG MARE study were along the lines of what was found in the ERA-MBT survey. Further, it was emphasised that the real issue was lack of collaboration between investors, industry, SME's and researchers.

In the ERA-MBT survey many respondents also pointed to lack of national policy and strategy for technology transfer and start-up companies as a high priority area. Similarly, the DG MARE survey identified a series of policy options that should be strengthened for the successful development of marine biotechnology.

The ERA-MBT survey asked respondents to express their opinions to the quality and access to infrastructures and tools. The majority answered that the availability was low, regardless of the infrastructures were public or private.

The DG MARE survey did not state the same questions, but from the feedback received it was concluded that the stakeholders reported that access to infrastructures was limited. However, in this survey a lot of emphasis was put on large infrastructures for obtaining samples for bioprospecting, i.e. vessels and equipment for sampling, often in remote areas.

Overall it is estimated that modern infrastructures and tools are essential for the successful development of marine biotechnology, but it is realised that good equipment is very expensive and difficult to get funding for. The quality of existing infrastructure is in general estimated as good, but there is a need for continuous updating if level of research and innovation is to be continued at the present level. Availability is fairly good, but due to lack of collaboration between academia and industry, the two sides are not utilising existing infrastructure and tools optimally. It is also considered that infrastructures are scattered in Europe.

The answers given in the ERA-MBT survey did not allow further analysis of what opinion the different stakeholder categories had on technology transfer because the number of responses for each category was not sufficient to make a more detailed quantitative analysis.

It is noted that DG MARE has proposed to organise a technology transfer workshop in the margins of what is called the Blue Bioeconomy Business and Science Forum1. This forum is a new unit being launched in May 2015. The ERA-MBT should seek to collaborate with DG MARE for arranging such a workshop, as both entities are targeting a common goal.

It is further suggested that TTOs are specifically targeted for the invitation to a technology transfer workshop as mentioned above, possibly organised by DG MARE and ERA-MBT jointly. In the DoW the milestone 15 specifies a workshop to be held month 21 on the issue of Bidirectional, science vs. Industry, knowledge transfer activities. The workshop described could consitute this milestone.

If further studies should be carried out on the subject of infrastructures and tools, it should be more finely divided into the different infrastructure categories. For bioprospecting vessels are crucial for sampling material and are thus a major infrastructure component for such studies.

The picture from the studies performed is quite clear, that infrastructures are dispersed and the existence of some equipment is poorly known. It is mentioned that the European Marine Biological Resource Centre (EMBRC) might help to improve the knowledge of existing infrastructure and also to introduce a better coordinate use. Another organisation could be the European Strategy Forum on Research Infrastructures (ESFRI).

A mapping of available pilot plants and how to get access to such facilities could be an interesting objective of further studies.

[1] http://europa.eu/rapid/press-release_IP-14-536_en.htm

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INTRODUCTION

This report presents results from deliverable D3.3, which constitutes a part of Task 3.1, WP3.

The ERA-MBT DoW specifies the following for D3.3: 'Technology transfer best practice across Europe needs to be identified and understood to match industry and academy needs and inform calls. An open day workshop will be organized where the scientific community, industry and end-users will be involved in bidirectional knowledge transfer activities. A practical approach on specific themes will be applied to identify patent licensing opportunities, potential partnerships and to define best practices for effective collaboration, including technical assistance of Technology Transfer Offices for securing IP rights and Innovations'.

Two actions have been performed for gathering opinions on the technology transfer best practice across Europe. The first was to include a set of questions in the survey made by ERA-MBT during the summer of 2014, which is reported separately, and the second was questions presented at the stakeholder meeting in Lisbon 28-29 October 2014. The results from both actions as far as technology transfer is concerned, are presented in this delivery report.

The results obtained in the ERA-MBT survey are compared with another recent survey on marine biotechnology. A study co-developed by the ECORYS/s.Pro/MRAG consortium contracted by DG MARE contained a questionnaire on some of the issues also raised in the ERA-MBT survey. The results are published in the publication "Study in support of impact assessment work on Blue Biotechnology"2. In the present report reference is made to this study as the 'DG MARE study'.

Instead of calling for a specific workshop focusing on knowledge on transfer activities only, it was decided to combine this subject with other subjects relevant to the scientific community, industry and end-users while ERA-MBT called for the stakeholder conference in October 2014. It was realised that the working programme of ERA-MBT contained a range of workshops, and that some of these could be combined, obtaining a better coherence between different stakeholder interests and making the actions more efficient.

[2] http://ec.europa.eu/maritimeaffairs/documentation/studies/documents/study-blue-biotechnology_en.pdf

TECH TRANSFER PRACTICE AND POLICY

It is very important that new technologies being developed as a result of research activities in laboratories and pilot plants are successfully transferred to industrial production, creating new job opportunities and increase value of products. The process of transferring new technologies from an initial phase to practical productions presents a lot of challenges and there are many pitfalls along the way before a new production is being achieved. Different people with different skills are involved in each step of the transfer process, and it is important that the communication between the involved partners run smoothly and critical details are delivered from one stage to the next in such a process.

In addition to the technical transfer itself it is also important that financial support is available throughout the process. At critical stages it must be assured that further transfer is economically feasible. In many cases there is no proof of financial benefit until the final product is being marketed, and e.g. venture capital at the later stages of the technology transfer process may become the limiting factor for a final realisation of a given production.

These considerations are general for all developmental processes where transfer from research to industry is being pursued. Within the ERA-MBT we want to confine the challenges to the marine biotechnology area and investigate how the involved stakeholders view the situation. Thus the mapping of tech-transfer practice and policy as outlined in the DoW for ERA-MBT. Elements like patent licensing opportunities are also involved, but will be covered in deliverable D3.2 in the same task under WP3.

TECH TRANSFER IN ERA-MBT SURVEY

The outline of the questionnaire used in the ERA-MBT survey is shown in Appendix 1. After some general questions for identification of the stakeholders having responded, a set of questions are asked related to technology transfer practice and policy. The general questions also gave information about what kind of raw materials the involved industries were processing, and the product categories they were in.

The mapping as presented here is thus restricted to the respondents having answered the questions presented in the survey. The questionnaire used was published on the ERA-MBT website and sent by direct mail to more than 900 stakeholders as given in the ERA-MBT contact mailing list. A total of 127 responses were received within the deadline set.

The majority of the stakeholders were those identified in the CSA-MBT, which were grouped into a Stakeholder Forum, mainly funding agencies, and a Stakeholder Group, mainly industry and associations. Lists of both groups are given in Appendix 2 and 3.

The Stakeholder Group was categorised as research, industries, policy makers, outreach professionals, infrastructures and networks, of which most were research, industries and networks.

Further to these stakeholders a range of new stakeholders had been identified as participants to conferences held and contacts supplied by the members of the ERA-MBT. The MBT environments have thus been continuously updated as concerns mapping of stakeholders of all categories. The present survey was an attempt to get an updated mapping of the different categories of stakeholders as well as their activities and opinions of the MBT environment. Due to limited resources within the ERA-MBT consortium, a quantitative survey was used, knowing that there might be shortcomings if the population of answers to the questionnaire was limited. The mapping of the ERA-MBT environment as such is presented in the report for deliverable D3.1.

A question asked in the survey was: What do you consider the main technological transfer problem(s) in marine biotechnology? The respondents were asked to only choose three out of seven answer options given and list them in order of importance. If none of the propose answers were found right, a possibility for ‘other’ issues was also provided. The results are shown in the table below.

Table 1. Technology transfer problems in marine biotechnology

MAIN ISSUES	PRIORITY 1	PRIORITY 2	PRIORITY 3	TOTAL
Level of public funding to bridge the gap between academia and industry	28	21	8	57
Insufficient co-operation between academia and industry	28	17	8	53
Lack of incentives for PP collaboration and problems associated with such partnerships	5	19	22	46
Lack of national policy and strategy for tech transfer and start-up companies	14	18	7	39
Limited access to resource material for R&D and pilot studies	9	3	19	31
IPR issues – Benefit sharing	2	9	11	22
Other	8	4	9	21

The highest number of first priority was given to the answers 'Level of public funding to bridge the gap between academia and industry' and 'Insufficient cooperation between academia and industry'. It was realised that such a complex question/answer situation could be difficult to interpret, so the respondents were given the option of making verbal comments to their different priorities.

Most such comments were given to main priority 1 and 3, where virtually no comments were posted to main priority 2.

Here are listed a few examples of the comments: 'the gap between marine biology and biotechnology remains too large'. Another respondent stated that market knowledge is missing, and still another mentioned 'lack of concise and focused strategy between different politic entities/ministries' as a problem, and proposed the solution to be 'more consultations involving all important political entities'.

A comment in somewhat the same direction was 'missing of a long time strategy…a three year funding period is usually not sufficient to be successful'. It was also stated that 'culture of entrepreneurship and building business from knowledge is underdeveloped in Europe'. A suggestion to improve this was 'the possibility of researchers to be part of a spin-off company'.

SUPPLEMENTARY QUESTIONS ON INFRASTRUCTURE AND TOOLS

For a successful technology transfer practise access to infrastructure and tools may become limiting factors in the process. Thus some questions of these aspects were included in the ERA-MBT survey.

Infrastructures and tools could be interpreted as anything from vessels necessary for sampling material for bioprospecting and biodiscovery, but it could also be interpreted as specific tools needed for handling sampled material or processing equipment, including pilot plant facilities. As the toolbox has also been tremendously developed, and continues to develop, analytical equipment and advanced instrumentation at lab scale is also relevant to consider.

The questions asked were divided into three parts: Please provide your opinion on the quality of infrastructure and tools available for marine biotechnology at a) the academic level, b) the industrial level and c) at the level of public organisations.

It was possible to give written comments on each part. The answers from each respondent should be considered together, but as some only gave comments to one or two out of the three, an impression is given below for each of the categories.

For each of the parts, respondents were asked to consider both quality and availability, each of which should be graded in the levels 'low', 'good' or 'excellent'. The respondents were further asked to elaborate on the levels given. Respondents' rating is given in tables below for each part.

Academic infrastructures and tools

The answers to the quality and availability of academic infrastructures and tools are given in the table below.

Table 2. Quality and availability of academic infrastructures and tools

ANSWER OPTIONS	LOW	GOOD	EXCELLENT	RESPONSE COUNT
Quality of academic infrastructure and tools	19	57	16	92
Availability of academic infrastructure and tools	39	40	13	92

	QUESTION TOTALS
Please elaborate	30
answered question	92
skipped question	40

Some of the respondents connected quality and availability such that due to lack of sufficient infrastructure (availability), the quality was considered 'low'. Further, there seemed to be agreement that infrastructure is scattered in Europe and there is a considerable lack of collaboration and cooperation in utilising existing infrastructure and tools. Funding was mentioned as a problem; particularly as high quality equipment is very expensive and takes a lot of skills to operate.

It was a bit strange to observe that the question of availability was interpreted as industry's access to infrastructure at academic institutions. Not many respondents commented on the availability for academic researchers as such.

The main impression was otherwise that there are many differences in different countries; however, the answers for each of the nationalities were too few to draw any specific conclusions.

Industrial infrastructures and tools

The answers to the quality and availability of industrial infrastructures and tools are given in the table below.

Table 3. Quality and availability of industrial infrastructures and tools

ANSWER OPTIONS	LOW	GOOD	EXCELLENT	RESPONSE COUNT
Quality of industrial infrastructure and tools	32	50	8	90
Availability of industrial infrastructure and tools	53	34	3	90

	QUESTION TOTALS
Please elaborate	27
answered question	90
skipped question	42

Several respondents repeated their statements for academic infrastructures as also applicable to industrial infrastructures. However, there seemed to be less knowledge about industrial infrastructures. The picture emerging was that some larger industries (not involved only with marine biotechnology) are in possession of very good infrastructures, whereas SMEs have to collaborate with academic institutions to get access to infrastructures, i.e. they do not have them in their own possession.

One respondent stated that 'industries/SMEs are specialised in doing the screening but these facilities are not always available for academia'. That must be interpreted as another lack of good collaboration and open-ness between academia and industry.

Again the picture is that the situation varies a lot in different European countries. Some states that they 'don't know companies related with marine biotechnology'. Two statements are somewhat contradictory, one saying 'there are numerous companies with marine biotechnology interests in Europe', while the other says 'there are very few companies with expertise in marine biotechnology, most are at early stage in development'. So the interest may be there, but expertise is lacking.

Public organisationsinfrastructures and tools

The answers to the quality and availability of public organisations infrastructure and tools are given in the table below.

Table 2. Quality and availability of public organisations infrastructures and tools

ANSWER OPTIONS	LOW	GOOD	EXCELLENT	RESPONSE COUNT
Quality of public organization infrastructure and tools	44	39	7	90
Availability of public organization infrastructure and tools	49	34	6	89

	QUESTION TOTALS
Please elaborate	27
answered question	90
skipped question	42

While quality and access are rated low, it seems that many respondents actually do not really understand what is meant by 'public organisations', which is also expressed explicitly by two respondents. One says that 'most of the infrastructure is quite new', while another says: 'I hope that EMBRC Research Infrastructure will help to solve the problem', indicating there is a problem.

A graphical overview of the results given in the tables are illustrated in Figure 1, which gives the overall impression that the quality is rather a bit higher than availability for all three categories of infrastructure and tools.

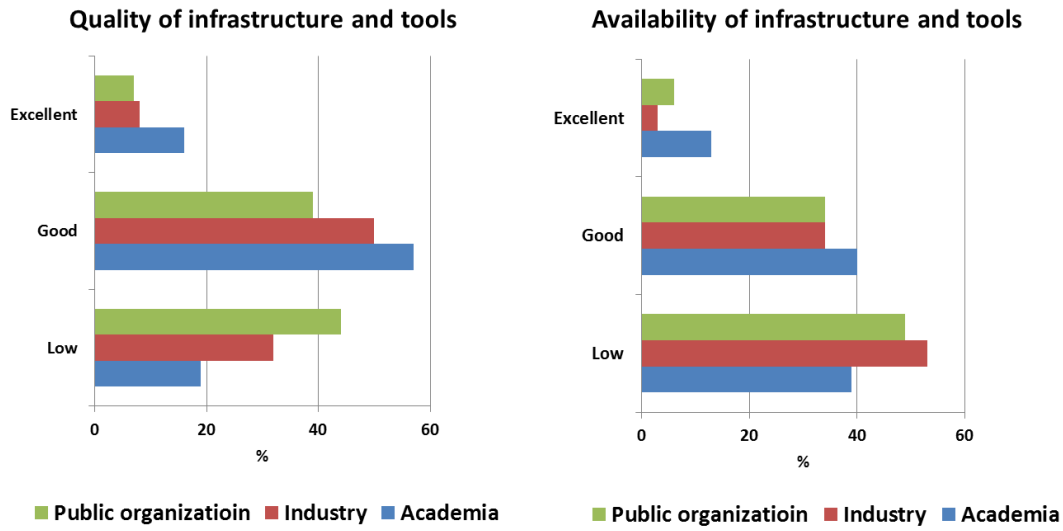

Figure 3. A graphical overview of results for quality and availability of infrastructure and tools

COMPARISON WITH THE DG MARE STUDY

The ERA-MBT survey found that the main barriers to successful technology transfer from research to industry was level of public funding to bridge the gap between academia and industry and insufficient cooperation between academia and industry.

At a workshop where the results of the DG MARE study was discussed the participants were asked to prioritise the barriers identified in the public consultation, and as the top barrier was lack of coordination and collaboration, and as the second most important barrier was financing. Most of the arguments were along the lines of what was found in the ERA-MBT survey. Further, it was emphasised that the real issue was lack of collaboration between investors, industry, SME's and researchers.

In the ERA-MBT survey many respondents also pointed to lack of national policy and strategy for technology transfer and start-up companies as a high priority area. Similarly, the DG MARE survey identified a series of policy options that should be strengthened for the successful development of marine biotechnology.

The ERA-MBT survey asked respondents to express their opinions to the quality and access to infrastructures and tools. The majority answered that the availability was low, regardless of the infrastructures were public or private.

The DG MARE survey did not state the same questions, but from the feedback received it was concluded that the stakeholders reported that access to infrastructures was limited. However, in this survey a lot of emphasis was put on large infrastructures for obtaining samples for bioprospecting, i.e. vessels and equipment for sampling, often in remote areas.

FEEDBACK AT ERA-MBT STAKEHOLDER MEETING OCTOBER 2014

As informed in the foreword to the present report two specific actions have been made to get a better understanding of the technology transfer practices within marine biotechnology. In addition to the survey reported above, some questions were asked at the break-out session during the Stakeholder meeting 28-29 October 2014 in Lisbon. A full report from this meeting has been published by ERA-MBT.

During the break-out session at the stakeholder meeting a question asked at one of the café tables was 'Are the project funding instruments well aligned to drive projects from good basic science through innovations needing proof of concept and value applications?' Among the answers given the following can be highlighted here:

- National tech transfer mechanisms are different. Understand and if possible align.
- Involve consultants (TTO-office?) in applied projects to support scientists and funders with market analysis regarding the invention being basis for a project.
- Use the TRL (Technology Readiness Level) scale to hit the right development stage in projects.
- Develop an open and robust match making platform (database?) on web.
    - Scientists need help to find interested industrial interest for inventions.
    - Industries need R&D inventions.

No direct question on infrastructure requirements was asked at the stakeholder meeting, but the stakeholders were asked which tools, techniques, processes and methods would be required to support the development of marine biotechnology. Some of the answers given were such as:

- Create a European marine bioresources database including the results of all evaluations and bioassays of compounds
- Establish repositories for marine organisms, extracts and molecules
- Develop common collection and sampling platforms
- Provide new tools to support "rapid" screening activity
- Broaden use and knowledge of "omics" in marine biotechnology and in screening
- Create environments that enable the production of targeted secondary metabolites
- Develop diagnostic tools to assess structural and functional characteristics of organisms
- Strengthened bioinformatics support for marine biotechnology
- Large scale infrastructure – research vessels, ROVs, for deep water and other collection/sampling platforms, e.g. autonomous vehicles for seabed sampling

CONCLUSION

Lack of public funding to bridge the gap between academia and industry, and insufficient co-operation between academia and industry are the most important reasons identified as a problem for successful technology transfer. The focus of the verbal answers in the ERA-MBT survey was more on lack of funding in general than on funding to bridge the gap between academia and industry in particular. The DG MARE study and the feedback from the ERA-MBT stakeholder meeting gave a more varied picture that should be used as background for further studies as described below.

Overall it is estimated that modern infrastructures and tools are essential for the successful development of marine biotechnology, but it is realised that good equipment is very expensive and difficult to get funding for. The quality of existing infrastructure is in general estimated as good, but there is a need for continuous updating if level of research and innovation is to be continued at the present level. Availability is fairly good, but due to lack of collaboration between academia and industry, the two sides are not utilising existing infrastructure and tools optimally. It is also considered that infrastructures are scattered in Europe.

The answers given in the ERA-MBT survey did not allow further analysis of what opinion the different stakeholder categories had on technology transfer because the number of responses for each category was not sufficient to make a more detailed quantitative analysis.

FURTHER STUDIES

It is emphasised that more funding is needed to provide a better technology transfer, but lack of clear policy is also mentioned. The question could thus be to get both elements in place to stimulate improved technology transfer and not at least to speed up the transfer of research results obtained in laboratory studies into industrial production.

It is noted that DG MARE has proposed to organise a technology transfer workshop in the margins of what is called the Blue Bioeconomy Business and Science Forum[3]. This forum is a new unit being launched in May 2015. The ERA-MBT should seek to collaborate with DG MARE for arranging such a workshop, as both entities are targeting a common goal.

As mentioned in the foreword to this report on D3.3 a further approach to TTOs is aimed at. This is confirmed as a valuable approach also in the feedback from the ERA-MBT stakeholder meeting. It is thus suggested that TTOs are specifically targeted for the invitation to a technology transfer workshop as mentioned above, possibly organised by DG MARE and ERA-MBT jointly. In the DoW the milestone 15 specifies a workshop to be held month 21 on the issue of Bidirectional, science vs. Industry, knowledge transfer activities. The workshop described could consitute this milestone.

If further studies should be carried out on the subject of infrastructures and tools, it should be more finely divided into the different infrastructure categories. For bioprospecting vessels are crucial for sampling material and are thus a major infrastructure component for such studies.

However, the further analyses of sampled material require advanced analytical laboratory equipment for screening purposes and subsequently studies of the chemical structures of the components identified. Later again, tools are needed for effect studies, including both in vitro and in vivo facilities, and in the case of potential pharmaceutical applications, clinical studies may also be included.

The picture from the studies is quite clear, that infrastructures are dispersed and the existence of some equipment is poorly known. It is mentioned that the European Marine Biological Resource Centre (EMBRC) might help to improve the knowledge of existing infrastructure and also to introduce a better coordinate use. Another organisation could be the European Strategy Forum on Research Infrastructures (ESFRI).

Before industrial production can be implemented, processes are taken from laboratory procedures through upscaling to pilot plant, and later to full scale processing. This also requires infrastructure and tools that are different from the items mentioned above. An overview of available pilot plants and how to get access to such facilities could be an interesting objective of further studies.

[3] http://europa.eu/rapid/press-release_IP-14-536_en.htm

APPENDICES

APPENDIX 1: OUTLINE OF QUESTIONNAIRE

General

1. **Please identify the country where your headquarters are based**
   Dropdown list of all countries
2. **Please identify the country/countries in which your organisation operates. If multi-national within Europe, choose „Europe", if global choose „International"**
   Dropdown Europe, International
3. **Please identify your category/categories** (tick boxes; multiple answers allowed)

- Larger industrial company (international)
- SME
- Industry cluster
- Industry association
- Industry network
- Consultant
- Technology Transfer organisation
- Regional organisation
- European organisation
- National organisation
- Funding agency/venture capital provider

4. **If you are representing a company please answer the following, otherwise go to question 5.**
   a. **What is the main marine biotechnology[4] activity of your company?** (tick box, multiple answers allowed)

- We use raw material from marine biomass
- We use marine related bio-information for development of products/services
- We develop product/services for use in marine bio-environment
- We do not have any marine biotech activity (if ticked then go straight to Q5)

   b. **What type of marine biomass does you company use for R&D or for production?** (tick box, multiple answers allowed)

[4] *Marine biotechnology company applies biological knowledge and relevant technology to generate knowledge, goods or services either a) by using marine biomass as source material or b) by using non-marine material for use in marine biotic environment (e.g. bioremediation, biosensors….). Add web ref if available.*

- Fish
- Molluscs
- Microalgae
- Macroalgae
- Bacteria
- Other, explain
- The company does not use raw material from marine source

c. **What is the main target market for your marine related products?** (tick box, multiple answers allowed)

- Food
- Energy
- Materials
- Cosmeticeuticals (e.g. skincare)
- Health (e.g. food supplements)
- Pharmaceuticals
- Environment and monitoring (e.g. biosensors, anti-fouling technology, bioremediation....)
- Production of commodities or services other than above, explain

Technical Transfer Practise and Policy

5. What do you consider the <u>main</u> technical transfer problem(s) in marine biotechnology (please only choose 3 issues from the list below in order of importance, where 1 is the most important) (Three dropdown lists):

3x,

i.e. after each tick the textbox appears

- Insufficient co-operation between academia and industry
- Level of public funding to bridge the gap between academia and industry
- Lack of national policy and strategy for tech transfer and start-up companies
- Lack of incentives for public-private collaboration and problems associated with such partnerships
- IPR issues – Benefit sharing
- Limited access to resource material for R&D and pilot studies
- Other

Please elaborate....

Suggested solutions or comments:

6. **Are there specific technical IPR/IPP issues for marine biotechnology? (Text box text length is max 2000 characters)**

7. **Infrastructure and tools**

Please provide your opinion on the quality of infrastructure and tools available for Marine Biotechnology at the different levels listed below:

- Quality of academic infrastructure and tools (dropdown - low, good, excellent)
- Availability of academic infrastructure and tools (dropdown - low, good, excellent)

  Please elaborate

- Quality of industry infrastructure and tools (dropdown - low, good, excellent)
- Availability of industry infrastructure and tools (dropdown - low, good, excellent)

  Please elaborate

- Quality of public organisation infrastructure and tools (dropdown - low, good, excellent)
- Availability of public organisation infrastructure and tools (dropdown - low, good, excellent)

  Please elaborate

Funding schemes and Marine biotechnology specific funding issues

8. Sources of funding.

- What is your main source of funding? (dropdown with following options, choose one and choose also share of funding 0-25%, 26-50%, 51-75%, 76-100%))
  - domestic public funding
  - EU or international funding
  - venture capital
  - other

  Please elaborate....

- Are there additional sources of funding? (choose one from dropdown list)
  - domestic public funding
  - EU or international funding
  - venture capital
  - Charity foundations (NGOs)
  - other

  Please elaborate....

9. What do you consider the <u>main</u> bottleneck for funding of marine biotechnology R&D (please only choose 1 or 2 issues) (Dropdown list):

2x,

i.e. after each tick the textbox appears

- Access to domestic public funding
- Access to EU or international funding
- Availability of funding for infrastructure and tools
- Access to venture capital
- Access to charity foundation (NGOs) funding
- Successful public-private partnerships
- Other

Please elaborate....

Suggested solutions or comments:

APPENDIX 2: STRATEGIC FORUM CSA MARINEBIOTECH

Country	Funding agency
Belgium	Belgian Federal Public Planning Service Science Policy
	National Fund for Scientific Research
	Department for Economy, Science and Innovation - Flanders
	The Research Foundation - Flanders
	Agency for Innovation in Science and Technology
	Flanders Marine Institute
Bulgaria	Ministry of Education, Youth and Science
Croatia	Ministry of Science, Education and Sport
Denmark	Danish Agency for Science, Innovation and Higher Education
	DTU Fodevareinstituttet
Estonia	Estonian Academy of Sciences
Finland	Academy of Finland
	The Finnish Funding Agency for Technology and Innovation
France	L`Agence National de la recherche
	Institut français de recherche pour l'exploitation de la mer
	Centre Nationale de la Recherche Scientifique
Georgia	Shota Rustaveli National Science Foundation
Germany	Federal Ministry of Education and Research
	German Research Foundation
	Agency for Renewable Resources
	Deutsche Bundesstiftung Umwelt
	Federal Ministry of economics and Technology
Greece	General Secretariat for Research and Technology
Iceland	The Icelandic Centre for Research
Ireland	Marine Institute
Israel	Ministry of Agriculture and Rural development
Italy	Ministry of Education, University and Research
Veneto region	Regione del Veneto – Project Unit Research and Innovation
Sicilian region	Regione Sicilia - Dipartimento regionale delle attività produttive
Latvia	LATVIJAS ZINATNU AKADEMIJA (Academy of Sciences)
	Investment and Development Agency of Latvia
Malta	Malta Council for Science and Technology
Netherlands	Netherlands Organisation for Scientific Research
	Department for Earth and Life Sciences -

Country	Funding agency
New Caledonia	Agence de Développement Economique de la Nouvelle-Calédonie
Norway	Innovation Norway
	The Research Council of Norway
Poland	National Centre for Research and Development
	National Science Centre
	Institute of Oceanology of the Polish Academy of Sciences
Portugal	Fundação para a Ciência e a Tecnologia
Romania	Executive Agency for Higher Education, Research, Development and Innovation Funding
Slovenia	Ministry of Education, Science, Culture and Sport
Spain	Ministerio de Economía y Competitividad
Sweden	Swedish innovation agency
	The Swedish Research Council
	The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning
Ukraine	Kyiv State Center for Scientific, Technical and Economic Information
UK	Technology Strategy Board
	Biotechnology and Biological Sciences Research Council
	Natural Environment Research Council
	Department for Environment, food and rural affairs
	Research Councils UK

APPENDIX 3: STAKEHOLDER FORUM CSA MARINEBIOTECH

country	organization	webpage	research	industries	policy makers	outreach professionals	infrastructures	network
Belgium	FlandersBio	flandersbio.be				■		
	VIB	www.vib.be/en/Pages/default.aspx	■					
Denmark	Dansk Biotek	www.danskbiotek.dk		■				
Baltic region	ScanBalt	www.scanbalt.org						■
Finland	SYKE	www.environment.fi	■					
	CIM	www.cimfunds.com/news.html		■			■	
France	Adebiotech	www.adebiotech.org	■	■				
	AllEnvi	www.allenvi.fr	■					■
	IASP/Atlanpole	www.atlanpole.fr						■
	OOB/EMBRC	www.embrc.eu	■					
	Pôle Mer Bretagne	www.pole-mer-bretagne.com						■
	GreenStars	-	■					■
Germany	BioCon Valley	www.bcv.org						■
	DECHEMA	www.dechema.de						■
	GEOMAR/Helmholtz Association	www.geomar.de	■					
			■					
	KDM German Marine Research Consortium	www.deutsche-meeresforschung.de/en						■
	MPI for Marine Microbiology	www.mpg.de www.mpi-bremen.de	■					
	Fraunhofer RI for Marine Biotechnology	www.fraunhofer.de/www.emb.fraunhofer.de/en.html	■					
Greece	IBRB, the National Hellenic Research Foundation	ctwww.eie.gr/index-en.html	■					
Iceland	Matís	www.matis.is/english/home		■				
Italy	BIONAT ITALIA S.r.l	www.bionatitalia.it		■				
	Stazione Zoologica Anton Dohrn	www.szn.it	■					
Luxembourg	LBMCC	www.lbmcc.lu	■					
Mediterranean region	CIESM	www.ciesm.org						■
Netherlands	Algae ARC	www.algaeparc.nl	■					
Norway	The Norwegian Bioindustry Association	www.biotekforum.no		■				■
	UMB	www.umb.no	■					
	Biotech North	www.biotechnorth.no						■
	Arcticzymes	www.arcticzymes.com		■				
Poland	Institute of Oceanology PAS	www.iopan.gda.pl	■					

country	organization	webpage	research	industries	policy makers	outreach professionals	infrastructures	network
Portugal	IMAR, Uni Azores	www.imar.pt	■					
	Algarve CMS, Uni Algarve	www.ccmar.ualg.pt	■					
	Bioalvo	www.bioalvo.com		■				
	EurOceans	www.eurocean.org				■		
	Biocant	www.biocant.pt		■				
	Biotrend	www.biotrend.biz		■				
	University of Aveiro	www.ua.pt	■					
Slovenia	Marine Biology Station Piran	www.mbss.org	■					
Spain	PharmaMar	www.pharmamar.com		■				
	IMR, Vigo	www.iim.csic.es	■					
Sweden	Linnaeus University	lnu.se	■					
Switzerland	Swiss Biotech Association	www.swissbiotech.org					■	
Turkey	Ege University	ege.edu.tr	■					
UK	Biosciences KTN	connect.innovateuk.org/web/biosciencesktn		■				■
	MBC, Aberdeen	www.abdn.ac.uk	■					
	Industrial Biotechnology Leadership Forum	https://connect.innovateuk.org/web/industrial-biotechnology		■	■			■
	Marine Scotland	www.scotland.gov.uk/About/Directorates/marinescotland			■			
	PML, Plymouth	www.pml.ac.uk	■					
Europe/regional	EuropaBio	www.europabio.org						■
	Nordic Pharma	www.nordicpharmagroup.com		■				
International industry	CEVA	www.ceva.com		■				
	Croda Chemicals	www.croda.com		■				
	DSM	www.dsm.com		■				
	L´Oréal	www.loreal.com		■				
	Novozymes	www.novozymes.com		■				
	Pierre Fabre	www.pierre-fabre.com		■				
	Unilever	www.unilever.com		■				
	World Ocean Council	www.oceancouncil.org		■				
	DuPont	www.dupont.com		■				
	Sanofi	en.sanofi.com		■				
USA	Woods Hole Oceanographic Inst	www.whoi.edu	■					
Russian Federation	Genetika	eng.genetika.ru		■				
Japan	Foundation for Biomedical Research and Innovation	www.ibri-kobe.org					■	
	OP BIO Factory	www.opbio.com		■			■	