Baltic Science Network

Connecting Through Science

Scientific Excellence in Life Sciences in the Baltic Sea Region

Report of the Expert Committee

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Project in brief

Baltic Science Network (BSN) serves as a forum for higher education, science and research cooperation in the Baltic Sea Region (BSR).

BSN is a policy network gathering relevant transnational, national and regional policy actors from the BSR countries. The Network is a springboard for targeted multilateral activities in the frame of research and innovation excellence, mobility of scientists and expanded participation. These joint activities are modelled with an overall aim to ensure that the BSR remains a hub of cutting-edge scientific solutions with the capacity to exploit the region's full innovation and scientific potential. The activities are modelled as examples of best practice which form basis of the policy recommendations drafted by the Network.

The platform is tailored to provide advice on how to enhance a macro-regional dimension in higher education, science and research cooperation. Recommendations jointly formulated by the Network members address the European, national and regional policy-making levels.

BSN is a flagship of the EU Strategy for the Baltic Sea Region under the Policy Area Education, Research and Employability, as well as one of two cornerstones of the Science, Research and Innovation Agenda of the Council of the Baltic Sea States.

One of the network's mission is the development of joint transnational strategies for scientific excellence (Work Package 3, Activity 3.2). BSN identified areas of scientific excellence in the region and assembled expert groups in these areas in order to

develop recommendations to further transnational cooperation in the BSR. The following working paper contains the recommendation of experts from the field of Life Sciences and provides input for both research institutions and policy makers on national and EU-level on how to enhance cooperation in this area of research in the BSR.

Disclaimer:

This working paper is based on the input from independent experts. Contents of the working paper do not necessarily reflect the views of the Baltic Science Network, or participating states represented in the Baltic Science Network, or international organisations engaged in the Baltic Science Network. Baltic Science Network cannot be held responsible for any use, which may be made of the information contained herein.

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1 Background

The Baltic Sea Region (BSR) is a life science research-intensive region with a multitude of research institutes, research infrastructures and living labs. The region includes world-class data resources and several of the countries are at the forefront in e.g. health data and digitalisation. The innovation potential is high in e.g. biotechnology.[1]

Some countries in the BSR have developed specific Life Sciences strategies, while in others Life Sciences priorities are part of broader national strategies or have emerged through more bottom up approaches. So far, there have been no specific efforts in creating a macro-regional coordinated strategy for the Baltic Sea Region.[2]

The BSR is home to high-level research infrastructures on many levels. The countries are involved in many Life Science relevant European-wide research infrastructure projects, but none of the projects include all BSR countries and there are no major infrastructures with a specific focus on joint use within the BSR[3]. A multitude of high-level assets are also available on the medium-sized level (nationally and regionally important infrastructures), including both physical facilities with affiliated know-how, and valuable data repositories. However, there is no proactive strategy for promoting cross-border shared use of these assets within the BSR, and there also appears to be a lack of broad knowledge about available assets.

BSR research environments are active participants in European and international cooperation projects in Life Sciences. The BSR as a research region is, however, rarely priority for the BSR countries involved nor for third countries. Various European cooperation mechanisms are broadly used, but few projects focus on the BSR as a region.[4]

Some important macro-regional cooperation platforms do exist in the region. Apart from the Baltic Science Network itself, which aspires to become the central overall coordination framework to develop and implement science policy within the Baltic Sea Region, important macro-regional actors include ScanBalt, a think tank and business accelerator with a specific focus on Life Sciences and the BSR, and NordForsk, the Nordic platform for research cooperation. Although many of the Nordic cooperation mechanisms enable Nordic-Baltic cooperation on e.g. health and well-being and research infrastructures, they do not involve all BSR countries on equal footing.

In a Europe consisting of strong regions, there is clear room for a BSR-focused platform on Life Science research. Looking at the region, one can easily identify

[1] All of the BSR countries rank within the top 40 in Scientific American Worldview ranking of innovation potential in biotechnology around the world, with Denmark, Finland and Sweden ranking in top 10.
[2] For the Nordic region, various NordForsk initiatives promote joint development in Life Science research, and there are also bilateral discussions especially between Denmark and Sweden.
[3] A list of these are found in the background study made for this paper
[4] As an example, among recent COST projects (2016-18), no projects were found with a life science focus that significantly gather BSR research organisations together.

several justifications for increased Life Sciences cooperation within the BSR. The region faces similar challenges in e.g. health and wellbeing that could gain from being tackled jointly by the countries and their RDI environments. These include for example public health challenges, such as demographic shifts towards ageing populations, and the rise in chronic diseases and comorbidities. The region also shares the same impacts of climate change, including new diseases in the region, and environmental hazards, such as the impact of pollutants present in the Baltic Sea. Opportunities to share knowledge and experiences is offered e.g. in the context of modernization of hospitals in the region. Geographic proximity is also an asset when e.g. working with and storing biological samples, an essence for Life Science research.

This work towards a joint strategy was provoked by the fact that the opportunities that macro-regional cooperation can bring to Life Sciences in the BSR are currently underutilised. Although representatives of research communities have identified several benefits of closer cooperation, the BSR still experiences a lack of cohesion, commitment and international attractiveness as a research region[5]. This again impacts the possibilities to utilise the full research and innovation potential of the region for the benefit of the economies and societies around the Baltic Sea, and for Europe as a whole. Acknowledging that there is a good ground to build on, the Expert Committee of the Baltic Science Network has outlined this report to support the development of a joint strategy for Life Sciences research in the Baltic Sea Region.

2 Aim of the Joint Strategy

The aim of the recommended Joint Strategy is to support Baltic Sea Region cooperation that raises the quality of Life Sciences research and thereby enhances the competitiveness and well-being of the societies.

The strategy will help to assess the feasibility and priority of these topics, in both long-term and short-term perspective, and makes suggestions for long-term and short-term objectives to be prioritized and actions to be taken in this context.

[5] See e.g. reports of the Baltic Science Network and DAAD listed in the background study to this paper

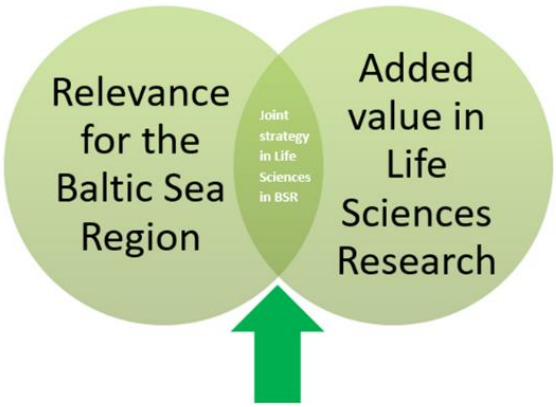

Figure 1: *The scope of the proposed strategy*

3 Short description of life sciences in the Baltic Sea Region

An analysis of the Life Sciences in the BSR (Figure 2) shows that there are many strengths to build closer cooperation on. Specifically, there are strong research environments within many fields of Life Sciences, and there is also a wealth of knowledge available on relevant topics for cooperation[6]. The educational base in Life Sciences is also strong, although there are notable variations between specialisations and institutions, with a few internationally renowned universities standing out.

Research environments in the region have vast experience of cooperation and strong existing networks to build on. Cooperation also benefits from the trust and awareness in the operating environments of research institutions and societies.

Although there are differences in the possibilities and incentives offered by society for entrepreneurship, many locations within the BSR demonstrate a motivating environment for business development, spanning from big pharma to research-driven start-ups. The region also demonstrates exceptional achievements in the development of enabling technologies.

Some weaknesses need to be overcome to fully utilise these strengths**.** In general, disparities in social development of the countries reflect on the level of research and development activities, and incentives offered for RDI. Joint BSR development in Life Sciences is further weakened by the lack of common strategies and standards. There is no given common denominator for 'BSR Life Sciences'. The benefits of BSR cooperation in relation to larger European cooperation are also poorly defined both

[6] Cf. the background study to this paper

on political and institutional levels and there are variations in political commitment towards BSR research cooperation, reflecting on the availability of resources and of research priorities of institutions and key researchers.

The funding systems for science and entrepreneurship vary significantly between the BSR countries, and there exist few funding opportunities for joint research between Baltic Sea Region countries. Apart from the challenges in funding, technology transfer from public to private sector is hampered by barriers related to technological, legal, and human resources issues, and obstacles for transnational market access for new technologies slows the transfer and scaling of new solutions that would benefit the whole region.

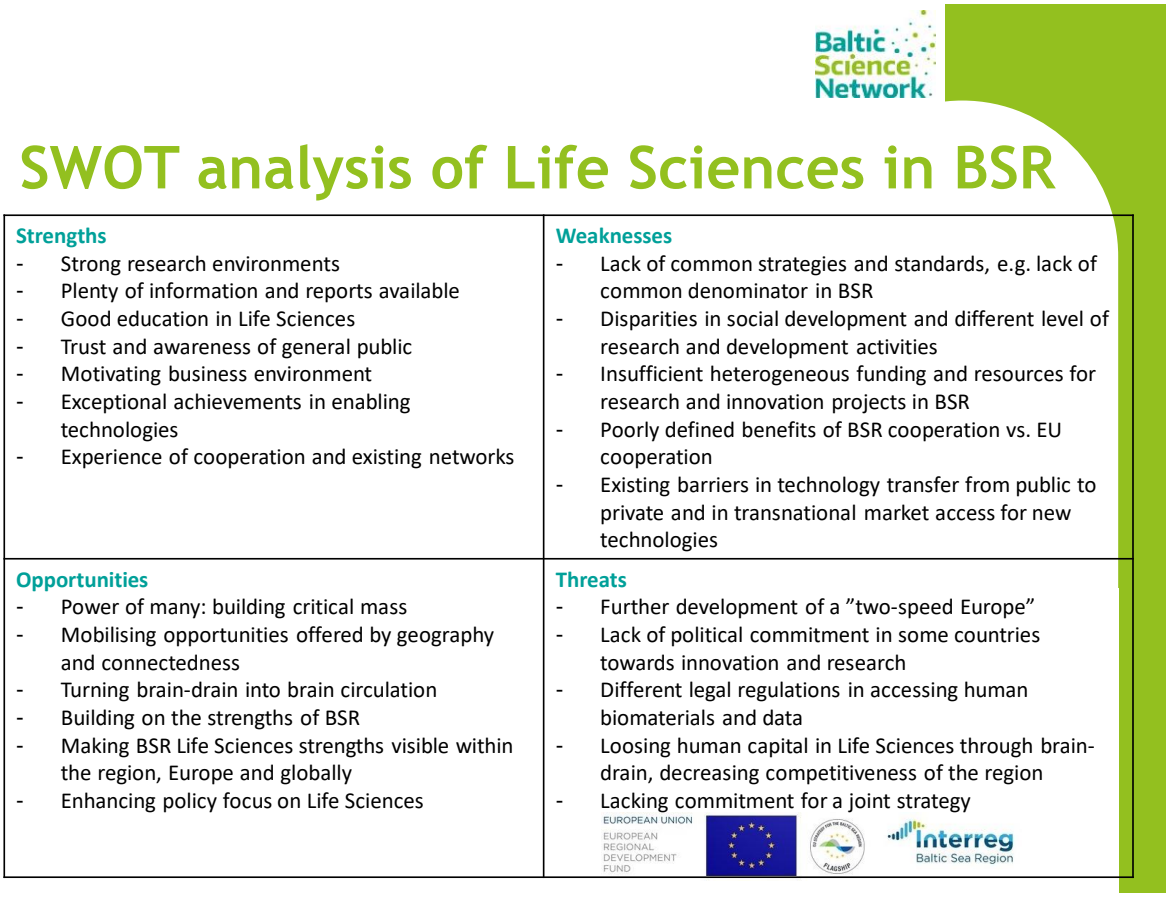

Figure 2: *SWOT analysis of Life Sciences in the BSR*

To overcome weaknesses and barriers, the full cooperation potential, building on the RDI strengths of the region must be harnessed. **Cooperation opportunities for the Life Sciences can** be found especially in the geographical proximity and connectedness of the research environments of the region. Most potential opportunities are related to pooling and sharing resources, and to utilising researcher mobility as an active tool for promoting brain circulation and network building in the region.

Especially in Life Sciences, building critical mass by pooling and sharing resources (such as infrastructures, registers and data banks) can enhance the quality and cost efficiency and open for new opportunities in research. This also includes an ambition to share good examples of accessing human material and data, shed light on the different legal regulations and promote a harmonisation of research assets and standards in the region.

Research mobility is widely acknowledged as one of the major factors facilitating excellence in science and competitiveness in innovation and technological development. Geographical proximity allows frequent short-time visits and face-to-face interaction, fostering the development of good networks and partnerships based on trust. A functioning researcher mobility system in the region, fostering short-term visits and collaborative relationships across the region can bring long-term benefits both to the research environments and the economies of the region, by turning the threat of brain drain into fruitful brain circulation.

The recognition of this added value and a strong researcher-driven approach can eventually help establish the region internationally as a world-class hub for research, development and innovation in Life Sciences. Such an approach will also help to halt the unhealthy development of a “two-speed Europe” and to attract political focus and commitment to RDI activities in Life Sciences across the whole region.

4 Opportunities for Baltic Sea Region cooperation in life sciences

Macro-regional cooperation is used as a tool in European cooperation for mobilising growth potential and smart specialisation and reduce fragmentation and disparities between regions in Europe. Macro-regional RDI cooperation is a tool for pooling and sharing resources, creating critical mass, thus raising the quality, efficiency, and widening participation in the development of the region.

The analysis made for this strategic paper suggests that the best opportunities to harness the development of Life Sciences research through BSR cooperation are found in building on existing cooperation structures and experiences, sharing unique resources, strengthening the networks, and fostering harmonisation in masters and doctoral training, public-private partnership (PPP) cooperation, and research practices.

By developing a flexible model for macro-regional cooperation that utilises the opportunities offered by instruments on regional, national and EU level, the proposed BSR cooperation in Life Sciences can also showcase good practices for EU cooperation at a larger scale.

It is proposed that the Baltic Science Network will engage relevant stakeholders to commit to opportunities within three Priority Areas:

1. **Fostering innovations in Master and PhD studies in life sciences.** The aim is to enhance the quality of Master and PhD studies. This is done by creating novel forms of international Master and PhD programmes that facilitate different forms of cooperation between universities, research institutes and businesses.
2. **Providing world-class infrastructure for BSR researchers in Life Sciences.** The aim is to ensure the most efficient use of existing infrastructure that benefits researchers in Life Sciences, through sharing, training and coordination.
3. **BSR world leader in life sciences industry.** The aim is to ensure strengthened competitiveness of businesses through increased cooperation with public R&D organisations in the BSR.

5 Joint Strategy and the Action Plan

Three priority areas have been identified, where BSR cooperation in Life Sciences brings specifically added value to the quality and effectiveness of research and innovation. Within each of the three defined areas of priority, the BSR Life Sciences strategy aims at implementing **selected actions within a time frame of 1-5 years**.

For each priority area, **long-term actions** have been outlined, including goals and description of the action, and responsibilities for policy makers, research and innovation funders as well as research organisations and industry partners.

The proactive role of the research communities in developing and implementing the actions is emphasised in the suggested strategy, building on the experiences of e.g. the European joint programming Initiatives. To highlight this role, a set of **Fast track actions** have been outlined for each priority area. These are actions that can be implemented within <1-3 years by the research communities themselves (incl. universities, research institutes and their existing industry partners).

Strong ownership for the strategy is needed on several levels. To drive and coordinate the commitment of the research environments, it is suggested that a network of central Life Sciences research organisations and infrastructure providers is created, taking model from existing networks within related fields[7]. To fully implement the long-term goals of the suggested joint strategy and action plan, strong commitment is needed also by policy makers and funding agencies across the BSR. To urge the mobilisation of such commitment, it is necessary that the Baltic Science Network develops its role as a platform for driving policy development in the region or that

[7] E.g. the NorDoc network

another more permanent body is established to take on the policy advice and coordination responsibilities.

The following tables show a tentative action plan for each of the three priority areas.

Priority Area 1 **Fostering innovations in Master and PhD studies in life science**			
Goal: To enhance the quality of Master and PhD studies			
Brief description: Novel forms of international Master and PhD programmes that facilitate different forms of cooperation between universities, research institutes and businesses will be created. This is done by mapping existing good practices and inventing new ideas based on needs of universities and research institutions in the Baltic Sea Region.			
Primary responsibility: Life Sciences universities in the region			
Partners: Universities, research institutes, industry partners, willing to commit to the consortium; research funding agencies and policy makers			
Fast Track Actions for Priority Area 1			
Action	**Description**	**Ownership**	**Time frame**
Best practices of joint curriculum development and harmonisation	Engage in dialogue especially with NordForsk and existing Nordic university networks on how Nordic universities have worked with curriculum harmonisation	Universities	<1 year
Short term visits to partner organisations	Encouraging Master and PhD students to do courses at partner organisations and make efforts to recognise course points in the degrees	Universities Research Institutes	<1-3 years
PPP pilots	Make agreement with selected partner companies on PPP mobility for Master and PhD students for short term visits from network partner institutions	Universities Research Institutes Industry Partners	1-3 years
Joint specialisation courses and summer schools	Organise joint BSR courses or summer school for PhD students, e.g.in conjunction to larger events in the region. Organise joint online courses e.g. in data management training.	Universities Research institutes	1-3 years

Long-Term Actions for Priority Area 1			
Action	**Description**	**Ownership**	**Time frame**
Joint development of curriculum	Make efforts to harmonise PhD and Master curriculum, in order to make mobility between partner institutions easier and an integral part of selected study programmes (building on the experiences of the Joint Committee of Nordic Research Councils in Medicine and Health NOS-M)	Universities Research institutes Dialogue with research funding agencies and policy makers	5 years
Business engagement in curriculum development	Invite industry partners, including the ScanBalt network, to participate in co-development of Master and PhD curricula with integral PPP mobility part	Universities Research institutes Industry partners Research funding agencies and/or policy makers	5 years
Recommendations to policymakers	Make efforts to sell the idea of international Master and PhD programmes to policy makers and funding agencies nationally in the BSR countries, regionally in the BSR and on the EU level	Baltic Science Network	1-5 years
Mobility requirement in funding schemes	Supporting international educational programmes by including mobility requirement into central national funding schemes	Research and innovation funding agencies	3-5 years
Joint curriculum implementation	Launch full-scale international PhD and Master programmes involving mobility between partner institutions and companies	Universities Research institutes Industry partners Policy makers Research and innovation funding agencies	>5 years

Priority Area 2 **Providing world-class infrastructure for BSR researchers**			
Goal: To ensure the most efficient use of research infrastructures in the BSR			
Brief description: Enabling sharing and joint use of research infrastructures as well as training activities, coordination and joint branding of infrastructures in the region			
Primary responsibility: Infrastructure providers in the region			
Partners: Universities, research institutes, industry partners, companies in the region, research and innovation funding agencies, policy makers, ERICs			
Fast track Actions for Priority Area 2			
Action	**Description**	**Ownership**	**Time frame**
Information about the important infrastructures in the countries and their use	Mapping and collecting information on most central and distributed infrastructures, benchmarking with the Baltic TRAM network, and making this information publicly available	Baltic Science Network Universities Research institutes	<1 year
Best practices of cross-border joint infrastructure use and guideline for joint use of distributed infrastructures	Collect best practices and lessons learned from ERICs and from Nordic infrastructure cooperation and make a plan for development of infrastructure sharing and joint use	Baltic Science Network Universities Research Institutes	<1 year
Platform for information exchange and competence sharing for infrastructure providers	Creating a forum for core facilities personnel at infrastructures within universities, research institutes and relevant industry partners	Universities Research institutes Industry partners	1-3 years
Use of infrastructure in mobility pilots offered in Priority Area 1	Include information on infrastructures as a motivation for mobility, offer advice on using infrastructure services to researchers, students and R&D personnel of industry participating in mobility pilots	Universities Research institutes Industry partners	1-3 years
Adapting the *European charter*	Development of access policies to infrastructure services using the	Universities Research institutes	< 1 year

for access to research infrastructures to use in the BSR	guidelines given in the European Charter for Access to Research Infrastructures. Principles and Guidelines for Access and Related Services		
Long-Term Actions for Priority Area 2			
Action	**Description**	**Ownership**	**Time frame**
Giving access to Life Sciences research infrastructures in the region	As a result of the short-term activities, enable the access and shared use of research infrastructures in Life Sciences		
Branding of infrastructure clusters in the region	Combining the information on available research infrastructures and competences of service providers – with focus on specialised 2nd degree/medium size infrastructures - and making this publicly available and marketed towards research communities and industry	BSN Universities Research institutes Research and innovation funding agencies Policy makers	3-5 years
Training, education and networking of the staff of core facilities	Use the forum for core facilities personnel at infrastructure providers as a platform for competence sharing and building	Universities Research institutes Industry partners	1-5 years
Educating a new generation of infrastructure users	Including use of infrastructures into the international mobility schemes and organising targeted courses / summer schools	Universities Research institutes Industry partners Research and innovation funding agencies	1-5 years
Improved competences in infrastructure management and services	Support the sharing of experiences and training in infrastructure management and development of functional business models for public research infrastructures	Universities Research institutes Industry partners Research and innovation funding agencies	1-5 years
Shared use of infrastructure as	Supporting access to and shared use of infrastructure by including	Research and innovation funding agencies	3-5 years

requirement in funding schemes	requirement into central national funding schemes		
Harmonisation of Terms of Use for infrastructures within the distributed infrastructure clusters	Mapping differences in legislation, regulation, and practices; analysing obstacles for shared infrastructure use and agreeing on joint solutions	Infrastructure owners Policy makers Research and innovation funding agencies	>5 years

Priority Area 3 **BSR world leader in life sciences industry**			
Goal: Increasing competitiveness of businesses			
Brief description: Increasing the collaboration between businesses and public R&D organisations, for new innovative solutions, will increase the competitiveness of both business and science, and support the economic development and wellbeing of the region			
Main responsibility: Leading Life Sciences industries in the region			
Partners: Universities and research institutes, infrastructure providers, business parks, ScanBalt, research and innovation funding agencies, policymakers			
Fast Track Actions in Priority Area 3			
Action	**Description**	**Ownership**	**Time frame**
Fostering partnerships with ScanBalt	As a starting point, initiating partnerships between the Life Sciences universities and research institutes and ScanBalt to accelerate implementation of the Strategy and its Fast Track Activities (preferably through a joint organisation of the Life Sciences Universities)	Baltic Science Network	<1-3 years
Providing input to organisation of next Life Sciences Baltic conference	Offering Enterprise Lithuania a partnership on organisation and broadening of the existing Life Sciences Baltics conference to become an even stronger platform in the region	Enterprise Lithuania Baltic Science Network Universities Research Institutes Industry partners	<2 years
Involving companies in Fast	Involving central industry partners in testing and developing the	Universities	1-3 years

Track Actions in priority areas 1 and 2	actions on PhD and Master mobility and joint use of research infrastructure	Research institutes Industry Partners	
Fostering cooperation with other macro-regional Life Sciences initiatives	Initiating cooperation and exchange of experience with Life Science initiatives within e.g. Nordic, Arctic and Danube region	Baltic Science Network	
Long-Term Actions in Priority Area 3			
Action	**Description**	**Ownership**	**Time frame**
Communication with policy-makers, industry and the public	Provide success stories on goals achieved in priority areas 1 and 2 to policy makers, industry and the public, raising the awareness and boosting the attractiveness of the BSR as Life Sciences region in national and joint European fora	Baltic Science Network Universities Research institutes Industry Partners	5 years
Establishing a High-Level international Life Sciences Forum in the BSR region	Taking model after world-class fora, engage Baltic Sea Region stakeholders in a Baltic Sea Region "Northern Lights" High-level Forum for Life Sciences	Existing fora and networks in the region (tbc), in cooperation with Baltic Science Network	5 years
Enhancing the access to talents, research infrastructures and results	Fostering the network of research organisations and companies, exchanging best practices for developing services for industry at the universities and research institutes	Universities Research institutes Industry Partners Research and Innovation Funding Agencies	5 years
Establishing virtual Living Labs to boost innovation and commercialisation	Within specific identified topics of priority to the industry, establishing macroregional virtual living labs for co-creation of innovative solutions, and for testing and piloting product prototypes to gain references to the industry	Universities Research institutes Industry Partners Research and Innovation Funding Agencies	5 years
Promoting favourable innovation and technology	Actively work towards the harmonisation of regulations and removal of obstacles for technology transfer between	Policy makers	>5 years

transfer ecosystem (legal system, access to capital, administrative issues)	public and private partners and between countries in the region	Research and Innovation Funding Agencies Industry Research Institutes Universities	

Annex 1: Background study for the Baltic Science Network Life Sciences Strategy

Contents

1. Introduction

This background study, made by Gaia Consulting Oy[1] for the Baltic Science Network (BSN)/University of Turku, supports the work of the BSN Life Sciences Expert Group[2].

This background study was made using methods of desk study and interviews. The desk study included a background paper produced by the University of Turku, as well as selected reports from Baltic Sea Region (BSR), Nordic and European cooperation, and information gathered from web sites and data portals. National and regional strategies and policy papers suggested by the BSN Life Sciences Expert Group were also studied.[3] Fifteen interviews were conducted with life science research, policy and industry experts, including six members of the BSN Life Sciences Expert Group.

The background study identified Life Sciences relevant priorities, topics, and cooperation mechanisms within higher education and research, research infrastructures, research-industry relations and mobility programmes in the BSR, Nordic region and the EU. Cooperation structures and projects of relevance for Life Sciences cooperation in the BSR were identified and highlighted as examples of cooperation mechanisms.

The findings do not represent an exhaustive description of the state of life sciences cooperation in the BSR. The intention was rather to provide a representative selection of examples of cooperation mechanisms that might be of interest and relevance for the BSN.

The main findings of the background study are briefly compiled in section 2-3. Section 2 includes a brief outline of the state of national and regional strategies and policies. Section 3 outlines cooperation mechanisms analysed from two dimensions: a) macroregional scope and b) type of cooperation mechanism.

Section 5 lists all materials used and interviewed experts as well as interview questions.

[1] Authors of this Annex: Susanna Sepponen, Emmi Holm, Santeri Palomäki and Solveig Roschier, Gaia Consulting 2018.

[2] The Life Sciences Expert Group was appointed by the BSN in 2018 to work on a strategic plan for Life Sciences cooperation in the Baltic Sea Region. The group was led by Jyrki Heino and members were Fredrik Björkling, Thomas Frahm, Toivo Maimets, Osvalds Pugovičs, Gintaras Valincius and Krzysztof Bielawski.

[3] References are listed at the end of this document

2. National and regional strategies and policies for Life Sciences

Among the BSR countries, specific Life Sciences strategies have been prepared at least in Denmark, Sweden, and Germany. In Finland, a Life Science strategy has emerged more bottom-up through the **Biocenter Finland**, a network of six universities that have jointly agreed to prioritise life sciences in their current strategies, and to share their infrastructure. Along with other EU countries, Estonia. Latvia, Lithuania and Poland have established smart specialisation strategies, which are here used as reference for national priorities.

The Danish growth plan for Life Sciences (March 2018) focuses on the attractivity of RDI in Denmark, the cooperation between pharma companies, research institutions, hospitals and public administration, the state of clinical research in Denmark, the availability of educated work force, the environment for start-ups, the digital transformation, internationalisation and export possibilities of Danish Life Sciences, and the organisation and implementation of the plan.

The Swedish roadmap towards a Life Sciences strategy (June 2018) concentrates on the use of health data, biobanks and registers from legal and operational perspectives; on policy development, infrastructure and AI in personalised medicine; and the integration of RDI into future health care (e.g. clinical trials and new innovative methods).

Germany has recently (Sept 2018) adopted a new **High-Tech Strategy 2025**, which includes recommendations for e.g. priority area medicine and health, including actions for e.g. treating severe illnesses and cancer, digitalisation and personalised medicine, and fighting infections, and new cooperative public-private models for drug development.

The Lithuanian smart specialization strategy includes six prioritised areas, among these "Health technologies and biotechnologies". It includes the priorities Molecular technologies for medicine and biopharmaceutics; Advanced applied technologies for individual and public health; and Advanced medical engineering for early diagnostics and treatment. Biotechnology is one of the fastest growing fields in Lithuania. According to interviews, the framework for Life Sciences in Lithuania will be further strengthened by a recent government resolution.

The **Latvian smart specialization strategy** outlines seven investment priorities and five specialization areas. The investment priorities include high added value products, modern education, and the knowledge base. The knowledge specialization areas include biomedicine and medical technologies, as well as bio-pharmacy and biotechnologies.

The selected growth areas of the **Estonian smart specialisation strategy** include Health technologies and services, which is also one of the selected priority growth

areas in the Estonian Entrepreneurship Growth Strategy 2014-2020 and the Estonian Research and Development and Innovation Strategy 2014-2020 "Knowledge-based Estonia".

The **Polish smart specialisation strategy** includes 18 priorities within five thematic areas, one of which is a Healthy Society, including medical engineering technologies, medical biotechnologies, diagnosis and treatment of civilization diseases and personalized medicine, and production of medicinal products.

The **Biocenter Finland Strategy 2018-2020** outlines the activities of the biocentre network, while Finnish governmental strategies are implemented e.g. through **Finland's Strategy and Roadmap for Research Infrastructures 2014–2020,** the **Competitive funding to strengthen university research profiles** and the **Flagship programme**. The University profiling funding is targeted at measures that strengthen the universities' strategic research fields and new initiatives. The funding has been available since 2015 and eight of the fourteen eligible universities have profiling areas within or closely related to Life Sciences. The Flagship programme offers considerable funding to selected research and impact clusters that will contribute to increasing the quality and impact of Finnish research. So far, only two Flagships have been established. The 2nd round is ongoing (as per October 2018) and among the shortlisted applications there is one relevant to the Life Sciences.

No remarkable coordination measures of national strategies were found in the study (apart from some discussions between Denmark and Sweden). Neither is there any specific Life Sciences strategy for the BSR. The most central macroregional strategies of relevance to BSR Life Sciences are the following.

Life Sciences and especially biotechnology are part of the **European 2020 Strategy** and the **Innovation Union flagship programme** and "health" and "biotechnology" are priority areas in the framework programmes (**Horizon2020** and the upcoming **Horizon Europe**).

On the macroregional level, The **EU Strategy for the Baltic Sea Region (EUSBSR),** which provides the broader framework in which the Baltic Science Network operates, addresses as one of its policy areas common health challenges of the region, including the spread of infectious diseases, and the impacts of environmental pollution on public health.

ScanBalt publishes analyses on the health economy, which outline priorities for industry cooperation. In the **ScanBalt report on Macro-Regional Development and the Health Economy,** the BSR is defined as a growing market but with disparities and lack of cohesion. The report advocates a macro-regional approach with strategies developed for targeted networking within selected disciplines where the strongest environments can function as hubs spreading competence into other related partner environments in the region and turning the BSR into a competitive region and attractive partner for large international RDI environments.

Nordic strategies and policies in Life Sciences cover large parts of the BSR. **Policy Papers of NordForsk** cover e.g. overviews of Nordic biobanks and registers, annual overviews of legislation in biotechnology, ethical review in biomedical research, and white papers of the Nordic research councils in medicine and health (NOS-M). NOS-M has recommended e.g. that PhD courses in the Nordic countries should be available to PhD students in all Nordic countries, coordinated to obtain critical mass in small and scattered research areas, credited through the ECTS (European Credit Transfer and Accumulation System) system and that ECTS credits should be similarly measured and transferable between the Nordic countries.

To sum up, there is a lot of knowledge and policies and strategies that give directions for BSR cooperation in Life Sciences. The **papers of the Baltic Science Network** complement this picture and can help create momentum for strengthened BSR cooperation in Life Sciences.

3. Cooperation mechanisms with selected examples

Cooperation mechanisms, here defined as measures and tools (agreements, funding instruments, platforms etc.) that can be used to support Life Sciences cooperation in the Baltic Sea Region, are found on many levels. The background study identified some 30 examples of cooperation structures and mechanisms that can provide direct support or good models for BSR Life Sciences cooperation. Cooperation mechanisms were divided into different categories using the dimensions ***macroregional scope*** and ***type of cooperation mechanism.***

The macroregional scope	Cooperation mechanisms
• European-level cooperation, which can be used in research and infrastructure cooperation within the BSR. • Baltic Sea Region focused cooperation • Nordic cooperation, which often include also Baltic countries, but rarely Germany and/or Poland. Purely bilateral cooperation was not included in the study.	• Central cooperation networks and platform • Infrastructure cooperation • Research-industry cooperation • Mobility tools • Other research cooperation (such as more ad hoc based research networks ad projects) was mentioned when of specific relevance for the BSR Life Sciences strategy

3.1. Central cooperation platforms

BSR research environments cooperate in joint European fora, such as **Science Europe**, the association of European Research Funding Organisations (RFO) and Research Performing Organisations (RPO).

EU-LIFE, a European alliance within life sciences, includes 13 top research centres that have joined forces to support and strengthen European research excellence. Two of the 13 partner institutes are situated in the Nordic countries (Biotech Research & Innovation Centre BRIC at the University of Copenhagen, and the Institute for Molecular Medicine Finland FIMM).

The Baltic Science Network (BSN) is now aiming at establishing a Baltic Sea Region focused platform for developing and implementing science policy and transnational strategies, incentives and programmes to support higher education, research and innovation and to develop R&I excellence within the BSR. The aim is also to ensure a better representation of macro-regional interests on the EU level.

The Baltic TRAM (Transnational Research Access in the Macroregion) is a project in parallel to the BSN. It seeks to strengthen the relationship between analytical research institutions and business, and link expertise to concrete industrial needs. The current focus is, however, on materials sciences, and there is per date no Life Science cooperation.

ScanBalt® fmba is Northern Europe's leading accelerator for inter-regional cooperation with a vision to develop the region into a Global Hotspot for Health and Bio Economy. ScanBalt functions as a think tank, accelerator and a business club. The ScanBalt Health Region project is one of the flagships of the EUSBSR.

Large parts of the Baltic Sea Region participate in activities of the Nordic research cooperation platform **NordForsk.** NordForsk facilitates numerous funding programmes and coordination activities on Nordic research, training and research infrastructure cooperation. These are focused on the Nordic countries (Denmark, Finland, Sweden, Norway and Iceland), but research environments from Estonia, Latvia and Lithuania participate in many activities. Germany and Poland have not been involved in the cooperation to any considerable extent.

The Joint Committee of Nordic Research Councils in Medicine and Health (NOS-M) functions in conjunction to NordForsk. It publishes policies and recommendations and works e.g. on the harmonisation of Nordic Medical PhD studies.

Nordic doctoral training in health sciences network NorDoc is a researcher-driven network established 2016 by doctoral schools/ faculties of health sciences. It aims to initiate, facilitate and intensify cooperation among the Nordic doctoral schools/faculties in all relevant fields for the benefit of Nordic doctoral candidates

and their supervisors, in order to support and ensure the highest possible quality in doctoral education in health sciences. It has currently nearly 20 members and is in principle open for participation of any Nordic doctoral schools/faculties of health sciences who accept the mission statement of NorDoc.

3.2. Infrastructure cooperation

High-level research infrastructures are a prerequisite for high level research. Infrastructures are often resource demanding and cooperation and joint use with other public and private research environments can gain both the quality and the cost-efficiency of research. Relevant research infrastructure cooperation on European, BSR and Nordic levels includes e.g. the following examples.

3.2.1. European large-scale research infrastructures

The **European Strategy Forum on Research and Infrastructure (ESFRI)** roadmap provides relevant examples of macroregional (mostly distributed) infrastructures. The following **European Research Infrastructure Consortia (ERIC)** have relevance for cooperation in Life Sciences and include participation of at least some BSR countries[4].

BBMRI-ERIC is a European research infrastructure for biobanking. They bring together all the main players from the biobanking field: researchers, biobankers, industry, and patients in order to boost biomedical research. They offer quality management services, support with ethical, legal and societal issues, and a number of online tools and software solutions. BBMRI-ERIC includes 20 countries and one international organization.

European Infrastructure for Translational Medicine (EATRIS-ERIC) provides tailored access to cutting-edge enabling technologies in translational research. Via the central hub one can access clinical expertise and facilities within the 80+ academic centres across Europe. EATRIS is the first research infrastructure in the Biological and Medical Sciences to receive the ERIC status.

European Clinical Research Infrastructure Network (ECRIN) is a public, non-profit organisation that links scientific partners and networks across Europe to facilitate multinational clinical research.

ELIXIR coordinates and develops life science resources across Europe so that researchers can more easily find, analyse and share data, exchange expertise, and implement best practices.

EU-Openscreen ERIC integrates high-capacity screening platforms throughout Europe, which jointly use a rationally selected compound collection, comprising up to

[4] The overview includes all Landmarks of the Health&Food sector, except from EMBRC, ERINHA, and INSTRUCT.

140.000 commercial and proprietary compounds collected from European chemists. EU-OPENSCREEN offers to researchers from academic institutions, SME's and industrial organisations open access to its shared resources.

The European Research Infrastructure for Imaging Technologies in Biological and Biomedical Sciences **(Euro-BioImaging, EuBI-ERIC)** provides open physical user access to a broad range of technologies in biological and biomedical imaging for life scientists. In addition, EuBI offers image data support and training for infrastructure users and providers.

Infrafrontier aims to build a world-class research infrastructure that provides the biomedical research community with the tools needed to unravel the role of gene function in human diseases.

In addition to the ERICs in Life Sciences, BSR is host to the **European Spallation Source** ERIC in Lund, which is operating the world's most powerful neutron source, and provides organisational best practice and visibility to the region.

Open Science support services on the European level are provided by e.g. the **EU eInfraCentral Consortium**. It addresses the needs of European researchers for digital services in terms of networking, computing and data management by fostering the emergence of Open Science.

3.2.2. Nordic research infrastructure cooperation:

NordForsk is committed to supporting joint use of research infrastructure in the region. Research infrastructure cooperation is assessed in all research funding. The research infrastructure cooperation focuses on increasing cross-border access to and joint use of existing research infrastructures in the Nordic region and globally, as well as supporting the establishment of new joint Nordic research infrastructures.

Nordic eInfrastructure Cooperation (NeIC) is a distributed organisation consisting of technical experts from academic high-performance computing centres across the Nordic countries that facilitates development and operation of high-quality e-Infrastructure solutions in areas of joint Nordic interest. NeIC provides support for eInfrastructure development, use and training.

3.2.3. Baltic Sea Region dimension

As the table below shows, none of the ERICS include all BSR countries, or any specific BSR focus.

	DE	DK	EE	FI	LV	LT	PL	SE	NO
BBMRI-ERIC	x		x	x	x		x	x	x
EATRIS-ERIC			x	x	x			x	x
ECRIN	x								x
ELIXIR	x	x	x	x				x	
EU-Openscreen ERIC	x			x	x		x		x
Euro-Bioimaging				x			x		x
Infrafrontier	x	x		x				x	x

While all of the research infrastructures in this table are recognised as priorities on the European level, there exists a lesser-known wealth of nationally and regionally prioritised infrastructures, the joint use of which would be beneficial for the life sciences in the BSR. The need to map these structures in order to create new cooperation opportunities in the BSR was emphasised in several expert interviews. Intensified cooperation on gathering and sharing information regarding national infrastructure facilities could be a valuable opportunity to strengthen the level of research and to enhance the attractiveness of BSR cooperation. Best practices could also be adopted from Nordic cooperation (section 3.2.2).

3.3. Research-industry cooperation

The BSR is a Life Sciences intensive region with a multitude of research institutes and infrastructures. The importance of linking the high-quality research to the Life Sciences industry was specifically emphasised in interviews, spanning from better PPP mobility programmes to the creation of Living Labs. Below are listed some of the identified tools for supporting research-industry cooperation.

On the European level, the major funding mechanisms all encourage research-industry cooperation, and these will not be specifically listed here.

Within the BSR, at least the following important players were identified:

ScanBalt is the central platform for research-industry cooperation in the BSR region. ScanBalt Business Club facilitates business development and market access. It publishes company news, partner searches and job adverts, promotes contacts to business support and investors and offers discounts on events. ScanBalt Business Club reaches out to 3000 companies, 50 university hospitals, 60 universities within health/life science incl. 25 with a focus on Medtech, 50 health care clusters and networks, 75 health care sector science parks.

Baltic Blue Biotechnology Alliance supports commercialisation, entrepreneurship, private-public partnerships and product development.

Life Sciences Baltics Conference is the only international forum in the Baltics for world-class biotechnology, pharmaceutical and medical devices experts from all around the world. It provides a unique opportunity to explore the new horizons of partnerships, exchange ideas and seek progress through networking. It is organised every second year in Lithuania.

Both ScanBalt and the Blue Biotech Alliance include members or associate members from all BSR countries. The Life Sciences Baltics Conference, based in Lithuania and organised by **Enterprise Lithuania**, a non-profit agency under the Ministry of Economy, is expanding its international profile, and could be a forum used more actively by all BSR countries.

3.4. Mobility tools

In a previous BSN study[5], more than 80 tools for supporting researcher mobility in the BSR were identified. Tools are provided by more than 30 organisations, covering Denmark, Estonia, Finland, Germany (with focus on BSR), Latvia, Lithuania, Norway, Poland, Russia (only Baltic Sea adjacent areas) and Sweden. They include joint European funding opportunities, programmes with specific focus on BSR cooperation, national and bilateral mobility tools, national research funding that enables mobility in the region, Nordic and Arctic mobility programme that can provide best practice for the BSR, as well as a few examples of regional and university-driven local tools. In addition to funding, tools that provide training opportunities, information, advice and support are regarded to be of considerable importance and a prerequisite for well-functioning mobility.

The mapping shows that there exists a great deal of tools that can be used towards supporting researcher mobility within the BSR. However, only few tools are designed with a direct focus on the BSR and most of these are rather small-scale, with the

[5] Sepponen, Roschier, Bröckl, Mikkola, Hjelt. Researcher Mobility Tools for the Baltic Sea Region. BSN work paper

exception of BONUS EEIG. Also, very few of them have any specific focus on Life Sciences.

Research mobility is widely acknowledged as one of the major factors facilitating excellence in science and competitiveness in innovation and technological development.

3.4.1. European level mobility tools

ERASMUS+ incorporates various programmes that aim to contribute to the Europe 2020 strategy for growth, jobs, social equity and inclusion, as well as the aims of ET2020, the EU's strategic framework for education and training.

- One example of ERASMUS+ projects in the region is **Edushare** that aims at joint capacity building in biomedical higher education through adopting international academic standards and transferring technology between European and Vietnam universities. It is coordinated by Estonia and with participation from DK, DE, SE, and Vietnam

Marie Skłodowska-Curie actions support both individual researchers and research environments.

- Research Networks support innovative training networks that bring together universities, research centres and companies from different countries to develop new generation of researchers.
- COFUND offers additional funding for new or existing regional, national and international programmes to provide an international and intersectoral dimension to research training and career development.
- Individual fellowships offer support for experienced researchers undertaking mobility between countries, with the option to work outside academia.
- Research and Innovation Staff exchange funds short-term exchanges for staff to develop careers combining scientific excellence with exposure to other countries and sectors.

3.4.2. Mobility tools in BSR cooperation

BSR-focused mobility tools include e.g. small-scale activities of the **Baltic University Programme,** and the **CBSS Summer University**. No specific Life Sciences relevant tools focused specifically on the BSR were identified. BSR mobility can be funded by European-wide tools (section 3.4.1) as well as Interreg-funded projects (section 3.5.2) or tools of Nordic cooperation (section 3.4.3).

3.4.3. Mobility tools in Nordic cooperation

NordForsk programmes usually include mobility requirements for intra-Nordic mobility. NordForsk activities within Health and Open Data are presented in section 3.5.3.

The Nordplus Programme offers financial support to a variety of educational cooperation between partners in the area of lifelong learning from the eight participating countries and three autonomous regions in the Baltic and Nordic area. During the past 10 years almost 5000 higher education networks have been granted funds, and according to the NordPlus database between nearly 300 of these are categorised to be within Bio- or Health sciences.

The Joint Committee of the Nordic Medical Research Councils (NOS-M) cooperates on **harmonizing Nordic medical PhDs.** Also the **NorDoc network,** presented in section 3.1. works with these issues.

3.5. Targeted programmes and networks

The broad basis of macroregional research cooperation lies in researcher-initiated informal contacts and networks. Researcher-driven associations and informal networks offer permanent platforms for cooperation, which can be supported and boosted by targeted interventions. These include e.g. research programmes, grants funding, or other coordination measures that support targeted research actions.

Although there are few cooperation mechanisms focused on Life Sciences in BSR, there are many tools on European, BSR and Nordic level that can be used to facilitate this cooperation. Also, many national funding schemes support international cooperation and mobility between institutes, countries and sectors. In addition, at least in some BSR countries, significant research funding is granted by private foundations. In Life Sciences e.g. **Novo Nordisk** is a good example.

There will be no attempt to give an exhaustive overview of the whole spectre of cooperation supporting tools here. Below we have listed some of the more significant interventions on European, BSR and Nordic levels.

3.5.1. Selected European cooperation mechanisms

Horizon 2020 and Horizon Europe: Health and biotechnology among prioritised areas.

The European Joint Programming Initiative on Antimicrobial Resistance (JPIAMR) has funded projects within 5 calls. Denmark, Estonia, Finland, Germany, Poland and Sweden are members.

The **COST** framework includes all EU BSR countries.

The Northern Dimension Partnership in Public Health and Social Well-being (NDPHS) provides a regional forum for concerted action to tackle challenges to health and social well-being in the so-called **Northern Dimension area**. Except from Denmark, countries from the whole BSR region participate, including Russia. The NDPHS database contains information about ~700 projects, e.g. the **Northern Dimension Antibiotic Resistance Studies (NoDars)** which focuses on the availability of comparable data in the Northern European regions.

Another question is how much e.g. EU-wide cooperation mechanisms are used for targeted BSR cooperation in Life Sciences. For example a screening of recent COST projects (2016-18) gave at hand that no projects had been granted with a life sciences focus that would have significantly gathered BSR research organisations together.

3.5.2. Selected Baltic Sea Region cooperation mechanisms

Interreg funded current projects include the central platforms of the Baltic Science Network (BSN) and Baltic TRAM, but also a multitude of more specific projects within the Life Sciences. A few examples include[6]:

ProVaHealth provides access to health infrastructures for start-ups and SMEs aiming for commercialization with excellent client validation opportunities, hands-on feedback and input for product development. The project is an EUSBSR Flagship, funded by Interreg, and located at the Tallinn Science Park Technopol.

Baltic Fracture Competence Centre (BFCC) will set up local fracture registries at five hospitals around the Baltic Sea Region and link them together in one transnational fracture registry.

BaltCityPrevention, where partners from 7 BSR countries test participatory and user-oriented approaches to develop and implement prevention and health promotion intervention.

Other central BSR networks of universities and research environments include the more general Baltic Sea Region University Network (BSRUN) and the Baltic University Programme (BUP), but also networks with specific focus on Life Sciences, e.g.

Baltic Sea Region Network in Personalized Health Care is a multi-disciplinary and cross-national network of the universities of the countries of the Baltic Sea Region.

Baltic Network against Life threatening viral infections (Baltic Antiviral Network) is a network against life-threatening viral infections focuses on the epidemiology, diagnostics, disease pathogens, and also vaccines - for HIV and viral hepatitis with participation from Sweden, Estonia, Lithuania and Russia.

[6] Note that these are only a few examples, as no systematic screening of all INTERREG funded Life Sciences relevant projects has been made for this study.

3.5.3. Selected Nordic cooperation mechanisms

The Nordic Programme on Health and Welfare of NordForsk funds several projects of relevance for the BSR Life Sciences strategy, including:

- **Nordic Information for Action eScience Center (NIASC)**, a Centre of Excellence which aims to provide an evidence base for establishing personalized health services and screening policies, e.g. through open access to biobank samples and better utilisation of ICT in research. In addition to the Nordic countries, the partnership includes research environments from Estonia and Poland.
- **Nordic Trial Alliance (NTA)** enhances Nordic cooperation on clinical multi-centre trials. Increased Nordic cooperation on clinical research will lead to a rise in the number of joint clinical trials and thus boost the attractiveness of the Nordic countries as partners in research.
- **Symptom monitoring after hospitalisation in patients with advanced heart failure - a Nordic-Baltic study,** including Norway, Sweden and Lithuania.

In addition, there is a multitude of Nordic research networks and projects that include partners from the Baltic countries.[7]

4. Material used in background study

4.1.Desk Study

BSN reports and working papers

- Visionary Analytics (2017), Study on Research Cooperation in the Baltic Sea Region: Existing Networks, Obstacles and Ways Forward
- Röbbelen-Voigt & Thees (2018), Joint Potentials in the Baltic Sea Region - Establishment of Expert Groups
- Sepponen, Roschier, Bröckl, Mikkola & Hjelt (2018), Researcher mobility tools for the Baltic Sea Region
- Ministry of Education and Research of Re-public of Estonia (2018), Drivers for Participation in Transnational Research Cooperation, Recommendations for

[7] These are not listed here in detail, but more information is found on www.nordforsk.org and the report Mapping of Nordic University Cooperation on Research. Susanna Sepponen, Ida Rönnlund, Marika Bröckl, Päivi Luoma, Mari Hjelt. Gaia Consulting, 2015 (NordForsk).

Increasing Participation of Low Performing Countries and Regions in Transnational Research Activities

- Musiał & Schumacher (2018), Scientific Excellence: Joint Potentials in the Baltic Sea Region – an explorative study
- Valinčius & Juknevičius (2017), Challenges to Researchers' Mobility in the Baltic Sea Region
- Schumacher (2016), International Mobility of Researchers in the Baltic Sea Region
- Them Parnas (2017), Challenges and barriers to research cooperation in the Baltic Sea Region
- Life Sciences Cooperation in the Baltic Sea Region

Baltic TRAM

- Stenvall-Virtanen (2018), Latest insights on Analytical Research Infrastructures
- Šime (2017) National innovation and smart specialisation governance in the Baltic Sea region - Laying grounds for an enhanced macro-regional science-business cooperation
- Baltic TRAM Industrial Research Centres

ScanBalt

- DanuBalt project (2016), Macro-Regional Development and the Health Economy: Practical Experiences, Models and Concepts for Macro-regional Collaboration between Regions and Clusters
- Blank & Frank (2013), Driving cross-sectoral innovation in health and life sciences: An Innovation Agenda for the Baltic Sea Region Health Economy

NordForsk

- Palmgren (2017), Nordic biobanks and registers - A basis for innovative research on health and welfare (Policy Paper 2/2017)
- Salokannel (2017), Ethical review, data protection and biomedical research in the Nordic countries – a legal perspective (Policy Paper 1/2017)
- Open Access to Research Data – Status, Issues and Outlook (Policy Paper 1/2016)

- The Joint Committee of the Nordic Medical Research Councils (NOS-M 2014). Nordic Potential in Medical Research – Cooperation for Success
- Sepponen, Rönnlund, Bröckl, Luoma, Hjelt (2015). Mapping of Nordic University Cooperation on Research

On national and metaregional strategies:

- Ministry of Economic and Business Affairs, Denmark (March 2018). Vækstplan for life science: Danmark som førende life science nation
- Government Offices of Sweden (June 2018). Färdplan life science – vägen till en nationell strategi
- Federal Ministry of Education and Research, Germany (September 2018). High-Tech Strategy 2025
- Ministry of Economy of the Republic of Lithuania (2014). Smart Specialisation Strategy (RIS3)
- Ministry of Education and Science, Latvia (2014). Smart Specialisation Strategy (RIS3)
- Ministry of Economic Affairs and Communications, Estonia (2014). Smart Specialisation Strategy (RIS3)
- Ministry of Economy, Poland (2014). Smart Specialisation Strategy (RIS3)
- Biocenter Finland (May 2018). Strategy 2018-2020
- Academy of Finland (2018). Finland's Strategy and Roadmap for Research Infrastructures 2014-2020: Interim Review Report
- Academy of Finland (2018). Competitive funding to strengthen university profiles
- Academy of Finland (2018). Flagship Programme
- European Commission (2015). Europe 2020 Strategy
- European Commission (2011). Europe 2020 Flagship Initiative Innovation Union
- European Commission (2018). Horizon 2020
- European Commission (2018). Horizon Europe
- EU Strategy for the Baltic Sea Region (EUSBSR)

Other reports and information sources used:

- Baltic University Programme

- BaltCity Prevention: Baltic cities tackle lifestyle related diseases
- BONUS: Science for a better future of the Baltic Sea Region
- Biotech Research and Innovation Centre (BRIC)
- COST Actions (reports from 2018, 2017 and 2016)
- DAAD & DZHW (2017), Facts and Figures on the International Nature of Studies and Research in Germany
- eInfra Central
- ESFRI Roadmap (edition Sept 2018):
    - BBMRI-ERIC
    - Biocenter Finland
    - Eatris
    - ECRIN
    - Elixir Europe
    - EU-LIFE
    - EU-Openscreen ERIC
    - Euro-Bioimaging
    - Infrafrontier
    - Institute for Molecular Medicine Finland (FIMM)
- Eureka Network Projects
- European Molecular Biology Laboratory
- Joint Programming Initiative on Antimicrobial Resistance
- Life Sciences Baltics 2018
- Marie Skłodowska-Curie Actions
- NeIC (NordForsk)
- NordForsk
- Nordic Trial Alliance (NordForsk)
- NOS-M
- ScanBalt Living Labs

4.2.Interviews

Interviewed members of the expert group:

- Jyrki Heino, Professor, University of Turku
- Fredrik Björkling, Professor, University of Copenhagen,
- Thomas Frahm, Director Project Management, Life Science Nord Management GmbH
- Toivo Maimets, Professor of Cell Biology and Director, Institute of Molecular and Cell Biology
- Osvalds Pugovičs, Director, Latvian Institute of Organic Synthesis
- Gintaras Valinčius, Director of Vilnius University Life Sciences Center

Other interviewed experts:

- Anton Bespalov, CEO of Partnership for Assessment and Accreditation of Scientific Practice
- Wolfgang Fecke, Director General, ERIC EU OPENSCREEN
- Peter Frank, General Secretary, ScanBalt
- Kim L. Kryger, Adviers, Eurocenter, Danish Agency for Science and Higher Education
- Maria Nilsson, Head of Unit for Register-based Research, the Swedish Research Council Vetenskapsrådet; Special Adviser, NordForsk
- Tero Piispanen, Director, Internationalisation Services and BioTurku at Turku Science Park Ltd
- Jaanus Pikani, Chairman of ScanBalt
- Grzegorz Węgrzyn, professor, Department of molecular Biology, University of Gdansk
- Iris Öhrn, Investment Advisor- Life Science, Business Region, Sweden

Interview Questions:

1. The Expert Group has agreed to focus the strategy on ***Life Sciences*** cooperation that benefits specifically from cooperation ***within the Baltic Sea Region***
    a. In your view, why is it important to cooperate on Life Sciences in the Baltic Sea Region?
    b. What are your expectations for the strategy?
2. The Expert Group has made a SWOT analysis of Life Sciences cooperation in the Baltic Sea Region Referring to this SWOT:

a. Which are to your view the biggest strengths and opportunities to build on in BSR cooperation in Life Sciences?

b. How can we overcome the weaknesses and threats?

3. The expert group has agreed on three themes to be included in the strategy which are:

   - Fostering innovation in Master and PhD studies in life sciences
   - Providing world-class infrastructure for BSR researchers
   - BSR world leader in life sciences industry

   a. What do you think of the proposed actions under each of these specific themes?

   b. How will these actions combine added value to life sciences research with relevance for the Baltic Sea Region (see Focus of joint strategy below on p 2)?

   c. Would you like to suggest other/additional actions under these specific themes?

4. Information request:

   a. Can you advise on background information that would be useful for the strategy work? The information can be for example national strategies and policy papers, web articles or reports, names of stakeholders or cooperation frameworks.

   b. Can you advise on any organisations or networks that you think should be contacted about the strategy work? Why? (For example: are they already engaged in this type of work, or is it probable that they could commit to this kind of work?)