Forskningsrådet

Evaluation of Life Sciences 2022-2024

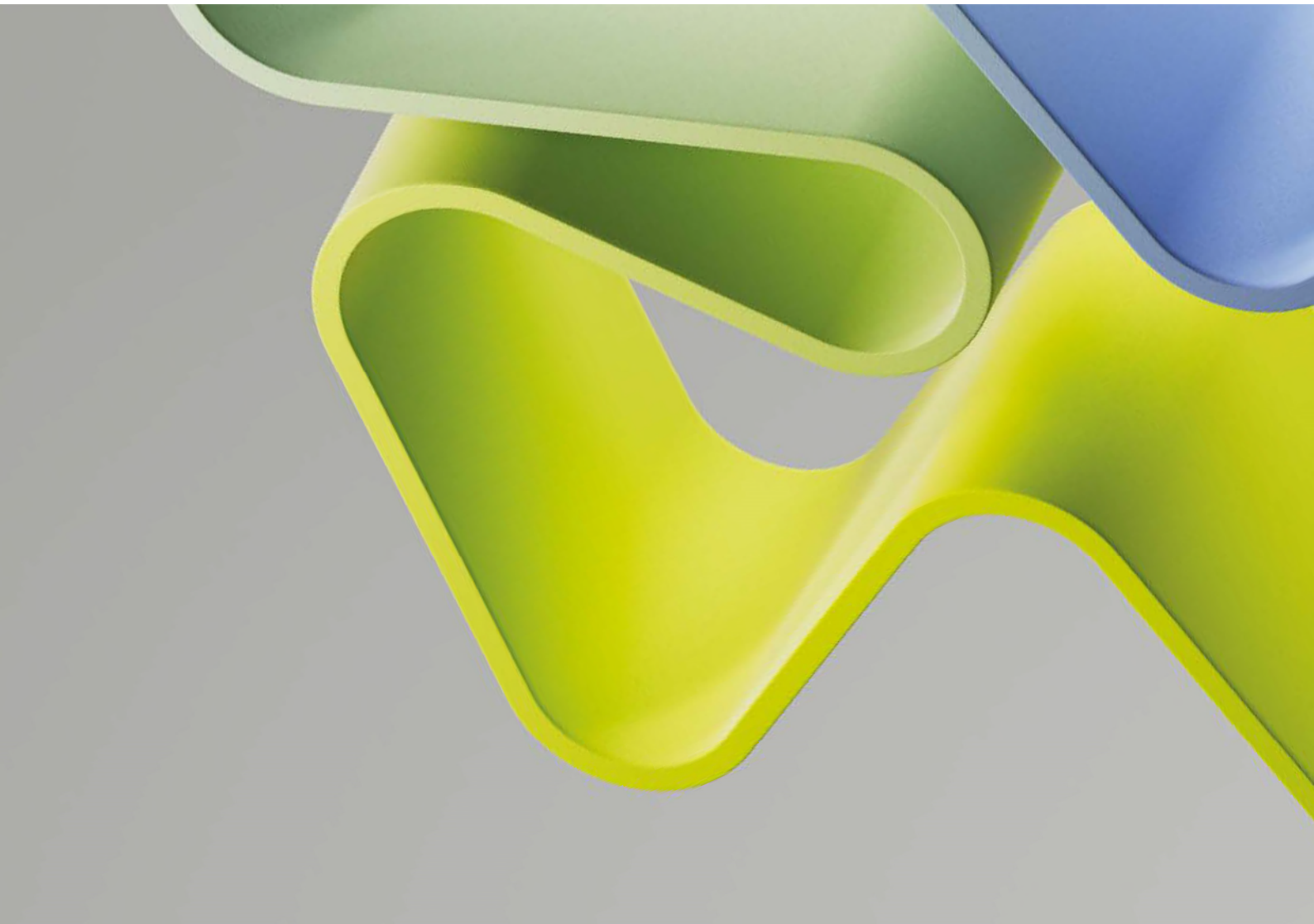
Evaluation of Biosciences 2022-2023

Evaluation report

Faculty of Bioscience and Aquaculture (FBA)

Nord University (NORD)

December 2023



Contents

Statement from Evaluation Committee 2

This report is from Evaluation Committee 2 which evaluated the following administrative units representing the higher education sector in the Evaluation of Biosciences 2022-2023:

- Faculty of Bioscience (BIOVIT), Norwegian University of Life Sciences (NMBU)
- Faculty of Chemistry, Biotechnology and Food Science (KBM), NMBU
- Faculty of Biosciences and Aquaculture (FBA), Nord University (Nord)
- Department of Biotechnology and Food Science (IBT), Norwegian University of Science and Technology (NTNU)
- Computational Biology Unit (CBU), University of Bergen (UiB)
- Department of biological sciences (BIO), UiB
- Department of Biosciences (IBV), University of Oslo (UiO)
- Department of Chemistry, Bioscience and Environmental Engineering, University of Stavanger (UiS)
- Faculty of Biosciences, Fisheries and Economics (BFE), University of Tromsø – The Arctic University of Norway (UiT)

The conclusions and recommendations in this report are based on information from the administrative units (self-assessment), digital meetings with representatives from the administrative units, bibliometric analysis and personnel statistics from the Nordic Institute for Studies of Innovation, Research, and Education (NIFU) and Statistics Norway (SSB), and selected data from Studiebarometeret and the National Teacher Survey (Norwegian Agency for Quality Assurance in Education [NOKUT]). The digital interviews took place in Autumn 2023.

This report is the consensus view from committee 2. All members of the committee have agreed with the assessments, conclusions and recommendations presented here.

Evaluation committee 2 consisted of the following members:

Professor/Dean
Ivo Sbalzarini (chair),
TUD Dresden University of Technology
& Max Planck Institute of Molecular
Cell Biology and Genetics

Professor
Caroline Austin,
Newcastle University

Professor/Pro-Dean
Ade Whitehouse,
University of Leeds

Professor/Deputy Dean
Lena Mäler,
Stockholm University

EM. Professor/Director
Nico P.E. Vermeulen,
Vrije Universiteit Amsterdam

EM. Professor/Director
Lene Lange,
Technical University Denmark

Adjunct Professor, dr.
Pikka Jokelainen,
Statens Serum Institut

Dr Anoushka Davé, Principal Consultant, Technopolis Group, was the committee secretary.

Oslo, December 2023

Profile of the administrative unit

In 2021, the Faculty of Biosciences and Aquaculture (FBA) had a total of 138 employees, out of which 19 were professors, 29 associate professors, 12 assistant professors, 20 researchers/postdocs, 24 senior engineers, and 24 PhD students. The share of women was high among assistant professors (65.7%). However, it was very low among professors (8.5%).

FBA is comprised of four research groups: Aquaculture, Algae and Microbial Technology (AAMT); Ecology; Animal Science, Production and Welfare; and Genomics.

In its self-assessment, FBA mentions that its research strategy is an action plan aiming to operationalise the goals of Nord University's 2030 strategy. The Nord University Strategy 2030 is based on four strategic core areas: Blue and Green Growth, Sustainable Innovation and Entrepreneurship, Health Welfare and Education, and Public Security. The FBA is strongly aligned with the Blue and Green Growth priority. In the self-assessment, it is mentioned that the faculty contributes in terms of education, research, and innovation in sustainable development, with a special focus on bio-economics. The unit aims to be a knowledge arena, based on collaboration between different disciplines and activities that are relevant to the blue/green circular bioeconomy. In doing so, the unit wants to build on its research in biodiversity, ecology, and evolution which generates new fundamental knowledge that is important for management of the environment, and on collaborative research conducted with the aquaculture and agricultural industries that often combines applied and fundamental research questions. The faculty aims to contribute to research-based knowledge in the green transition and will work to accentuate Nord's blue-green research during the UN's Decade on Ecosystem Restoration and the UN's Decade on Ocean Science.

As a higher education institution (HEI), FBA strives to follow the four overall goals for HEIs that receive public funding: high quality in research and education; research and education for welfare, value creation and innovation; access to education (esp. capacity in health and teacher education); and efficiency, diversity, and solidity of the higher education sector and research system. In relation to this, in its self-assessment FBA mentions that its overall goal is to provide higher education at an international level. FBA is obligated to provide research-based education within the "blue and green growth" strategic area at Nord University, contributing to the "green shift" agenda of the EU and Norwegian government. Education offered at FBA covers marine and terrestrial biosciences, including biodiversity, the effects of climate change, animal welfare, and sustainable animal production in both aquaculture and agriculture.

Based on its self-assessment, in the future FBA might take advantage of its research infrastructure for research-based education. A new faculty building will provide state-of-the-art laboratories, a new research vessel co-owned with the Institute of Marine Research and collaboration with upper secondary schools in Trøndelag region (Mære, Skjetlein) will propel research on developmental biology, epigenetics, sustainable feed ingredients, animal welfare, and sustainable production of food from aquaculture and agriculture. The research output of the faculty has increased since 2017, positioning the faculty on par with other life science milieus in the Norwegian University sector.

Overall assessment

The FBA at Nord University was assessed according to the criteria set out in the Terms of Reference supplied by the Unit. Overall, FBA is performing good-quality research in a range of areas including understanding biological, ecological, and environmental systems and sustainable development. The expert panel evaluations indicated some research groups are performing better than others, with some doing world-leading international research, but there is variability in productivity and attracting external funding. A clear vision is required to strengthen the less productive groups and develop more synergies between the research sites. This will provide critical mass for attracting larger and interdisciplinary strategic grants that have societal impact and address grand challenges. A clear research strategy would help strengthen the unit's research position in strategically important areas nationally and internationally.

A particular strength of FBA is its unique infrastructure in the form of research vessels, field station, and farms in addition to state-of-the-art laboratories and a genomics facility. These facilities will be key in building FBA's national and international profile and international recruitment policy. It clearly constitutes a strong advantage for the unit, and ongoing research should capitalise on these infrastructures. However, a challenge will be to maintain, fund, and further develop this cutting-edge infrastructure in the future.

FBA has a strong reputation in teaching and offers both inspiring and occupationally relevant education. FBA has easy access to companies and the environment, which helps ensure the education and training is economically relevant. To live in the Arctic is unique and motivating for students with facilities that are difficult to access elsewhere. FBA has easy access to a long coastline and activities in the blue sector.

Moreover, FBA should be commended on its research culture and support programme for early career researchers with a "Talent Retention" Scheme – a six-month follow-on funding to enable PhD candidates to complete research papers after thesis submission. The Committee hopes this will be continued. Support for mid-career researchers with their "Professor Programme" provides very good mentoring support for junior faculty and postdocs, where 20-30% of those supported then write an independent faculty grant to RCN. The Committee hopes this will also be continued.

Recommendations

The evaluation committee wishes to extend the following recommendations to the unit, which are constructive suggestions from an outside view on the basis of the information available to the committee and considering the aspects highlighted in the Terms of Reference.

Research Strategy:

- We understand a research strategy is currently being developed. FBA should develop its research vision to address global grand challenges and articulate this in a clear research strategy.
- FBA would benefit from having an external strategic advisory board composed of international members to ensure their vision and strategy is research question-driven rather than organisational or operationally driven.
- FBA needs to get measures in place to strengthen the research groups.
- The expert panels recommended three of the research groups needed to more clearly articulate their research vision and formulate strategies to achieve their vision and maximise impact. These three groups could seek advice and guidance from the AAMT research group which the expert panel deemed had a clear research strategy.
- The research groups should also consider establishing advisory groups including external members from other Norwegian universities and industrial partners to further develop their research.
- FBA should focus on excellence in research groups.
- There is room to improve FBA's influence and impact by improving research visibility via its website.
- FBA should try to find opportunities to increase participation on national and international policy-making bodies.
- To capture more external funding, peer-to-peer mentoring could be utilised to share grant writing skills to increase funding success rates.
- Staff have both teaching and research duties. This can restrict time for thinking and grant writing. Going forward, it would be good to include provision for staff sabbaticals.

Research Infrastructure: FBA has invested in excellent infrastructure.

- FBA now needs to focus on a strategy to utilise the infrastructure optimally for organisational and societal benefit.
- Where possible, FBA should try to gain access to national and international infrastructures relevant to its research priorities.

Research Staff:

- Communication could be improved by more regular faculty meetings.
- FBA still lists assistant professors and should consider promoting them to associate professors.
- Succession planning is needed to retain or recruit expertise in areas of research excellence.
- FBA should ensure that staff and students are aware of how to access disability support should they need it.

1. Strategy, resources and organisation of research

At interview, the Committee was informed the FBA strategy would be developed after the evaluation to also include input from the evaluation process. At the interview, the impression was that the FBA's focus was still on reorganisation, with no clear research strategy yet. FBA is a relatively new unit and has the geographical challenge of split campuses. At the Steinkjer site, new academic staff have been recruited and are still getting established. A new faculty building will open in Bodo in 2024 and FBA gained access to a new research vessel in 2023. FBA does not evaluate group performance individually but only as a faculty collective. This will make identifying areas where strengthening is needed challenging.

Currently, by default a bottom-up approach by the individual research groups appears to be in operation and this is working better in some groups than others, with only one group (AAMT) deemed to have a clearly articulated strategy. All four research groups aim to provide top-quality, research-informed teaching and all academic staff are expected to both teach and do research. However, the organisational dimension scores from the expert panels were 4 for two groups, and 3 and 2 respectively for the other two groups, suggesting room for improvement. However, the research in two of the impact cases from FBA is excellently aligned with the Norwegian Feed Mission.

Currently there is little use of sabbaticals to give respite from teaching to free up time to think, develop new ideas for grants, and to write new grants. There are internal grants to prepare bigger grant applications. While this is very good in principle, it was not clear how long these are for or what assessment criteria are used to award them.

1.1 Research Strategy

Nord University was formed in 2016. Its focus is on excellent education within the region underpinned by excellent research relevant to the courses taught. The University Strategy 2030 has a clear research and education vision, within which FBA falls within the blue and green growth priority. FBA submitted 4 groups for expert evaluation. The expert panel assessment was that the AAMT research group had a clear research strategy, providing an example of good practice that the other research groups could learn from.

The self-assessment document (Section 2.1.1) did not articulate a clear unit-level strategy for FBA. The FBA action plan "FBA towards 2024" had elements of a research strategy and a three-year action plan. An internal process to draw up a new research strategy is ongoing. A major strategic aim going forward is to maximise FBA's research potential from recent major infrastructure investments and to fulfil the university research strategy by 2030. The FBA's internal process will be informed by the EVALBIOVIT evaluation report, particularly the strengths and areas for improvement highlighted therein. As Norwegian universities face cuts in their budgets, the new unit action plan aims to maximise efficiency to free resources to address strategic research objectives. FBA's research vision should aim to address global grand challenges. *FBA would benefit from having an external strategic advisory board composed of international members to ensure its vision and strategy is research question-driven rather than organisational or operationally driven.*

1.2 Organisation of research

Nord University aims to provide excellent education underpinned by excellent research. The Nord FBA unit submitted four groups for expert evaluation. Two were assessed by expert panel 2 (Aquaculture and Algae and Microbial Technology group (AAMT) & Ecology and two by expert panel 4a (Genomics & Animal Science, Production and Welfare). All four groups have a strong emphasis on research-based teaching, which provides a well-trained and skilled workforce. This reflects the origins of Nord but means most staff spend most of their time teaching (74% according

to the survey for academic staff in Norwegian higher education 2020-2021), leaving restricted time and capacity for research. Currently, there is limited scope for sabbaticals, reducing the time to think and develop new avenues of research.

The Animal Science, Production and Welfare group was established in January 2017. It is located on two sites and covers a broad research portfolio (aquatic and livestock), both of which provide significant organisational challenges. AAMT's research strategy focuses on aquaculture and marine bioresources. The Ecology group supports "green change". The Genomics group runs the genomics platform for the FBA and thus plays an important strategic role within Nord University.

FBA is a relatively new unit. To date, its focus appears to have been on building infrastructure and it now needs to focus on a strategy to utilise the infrastructure optimally for organisational and societal benefit. We understand a research strategy is currently being developed – *It would be good to include good provision for staff sabbaticals.*

1.3 Research funding

FBA turnover in 2021 was 143 million NOK, of which 19% was external funding (approximately 27 million NOK). External funding had increased from about 23 million NOK in 2019. The four research groups' combined budget in 2021 was 81.6 million NOK, with around 33% from external funding, which is low in international comparison. Grant acquisition via competitive funding calls included grants from the Research Council of Norway (RCN), Norwegian Seafood Research Fund, Horizon 2020, and European Research Council (ERC), with one of the professors securing an ERC consolidator grant. However, FBA's competitive external funding and industrial funding is not distributed evenly across the four research groups. *Peer to peer mentoring could be utilised to share grant writing tips to increase funding success rates.*

All four research groups have excellent institutional funding for infrastructure (labs, aquaria, farms, field station and research vessels) plus access to sequencing and bioinformatics via the genomics laboratory. Due to national changes, core funding is being reduced by 5.7 million NOK (approximately 3-4% of core funding). Rationalising teaching to reduce costs without losing quality is ongoing, for example the reorganisation of BSc programmes across the two campuses. Sustained cuts would pose a serious threat.

PhD candidates are funded from core funds, while most other research projects require external funding. Investing in PhD level training is seen as a priority. *An example of good practice is providing six months' funding for PhD candidates upon completion of their theses to ensure publications arising from their PhDs get published.*

1.4 Use of infrastructures

A new faculty building will be opening in 2024 in Bodo with state-of-the-art teaching and research space and new laboratory facilities within the InnoCampus at Steinkjer (shared with Norwegian Institute of Bioeconomy Research, NIBIO). This will provide new opportunities, though the challenge of working across two distant sites remains.

FBA has excellent physical infrastructure, including well-equipped laboratories for genomics, cell biology, biochemistry, and histology; aquaria for multiple fish species used as model organisms (zebrafish, stickleback, and anglerfish); a field station at Bodo; and two research vessels. For agricultural livestock research, FBA has collaborations with agriculture schools in Trøndelag and privately-owned farms. Bioinformatics support and infrastructure include access to national E-infrastructure such as Sigma2 and Norwegian Research Infrastructure Services.

In 2023, the unit became a member of the alliance of European coastal universities – the SEA-EU University Alliance. The FBA submits data to or extracts data from national infrastructures and

databases including the Norwegian Marine Data Centre (NMDC) and the Lofoten-Vesterålen (LoVe) Ocean Observatory, a cabled observatory. Staff members have extracted data and used it for the Norwegian Barcode of Life Network (NorBOL).

The administrative unit also uses international infrastructures and databases, including the Global Biodiversity Information Facility (gbif.org); Ocean Biodiversity Information System (OBIS; obis.org); World Register of Marine Species (WoRMS; marinespecies.org); World Register of introduced Marine Species (WRiMS; marinespecies.org); Catalogue of Life (CoL; catalogueoflife.org); GenBank (ncbi.nlm.nih.gov/genbank); Bio-ORACLE marine data layers for ecological modelling (bio-oracle.org); Global Marine Environment Datasets (GMED; gmed.auckland.ac.nz); European Marine Observation and Data Network (EMODnet; emodnet.ec.europa.eu); and Copernicus (Copernicus.eu; cds.climate.copernicus.eu). This is very good.

1.5 National and international collaboration

FBA members are actively involved in national and international collaborations, as evidenced by research papers with national and international co-authors. Between 2017 and 2021, the percentage of publications with national co-authors ranged between 26% and 28%, and those with international co-authors ranged between 66% and 86%. Between 2019 and 2021, 45 publications were joint with NTNU, and 69 publications were joint with Wageningen University in the Netherlands. FBA contributes to a number of international taxonomic databases like WoRMs, GBIF, and OBIS. Research networks include a Norwegian Directorate for Higher Education and Skills (HK-DIR) funded project (NORPART programme) on circular bioeconomy and the SEA-EU University Alliance. FBA contributes to the Intergovernmental Panel on Climate Change (IPCC) and Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).

New collaborations can emerge when staff present at international meetings, and there is an annual budget for this. PhD candidates are expected to have at least two international presentations during their PhD and have allocated funding of 225,000 NOK from which they can spend one third for international travel. This is excellent and should be continued. International mobility is encouraged. Initiatives for mobility include Erasmus+ for student mobility. Another way to foster collaboration is via sabbaticals. The sabbatical system at FBA, however, does not appear to be very active, as there is no funding in place for this. Funding sabbaticals would increase international collaborations.

1.6 Research staff

The staff number presented in Form 7 is 138, including PhD candidates and engineers. They are employed at two sites, Bodo and Steinkjer. Form 7 includes 12 assistant professors (66% female). However, the document “The Norwegian research system – structure and main characteristics” supplied to the Committee indicates that the position of assistant professor (amanuensis) has been removed. If this is correct, *why does FBA still have assistant professors?*

The self-assessment document states that staff spend approximately half their time on teaching and half on research. However, a survey of staff with 30 respondents from FBA (survey for academic staff in Norwegian higher education 2020-2021) indicated that only 26% of staff time was spent on research. Time to think and plan the research are important and can get squeezed out when teaching loads are too high. *It would be good to include good provision for dedicated research time and staff sabbaticals.*

2. Research production, quality and integrity

NORD FBA is a relatively new unit. So far, its focus appears to have been on building infrastructure. *FBA now needs to focus on a research strategy to utilise the infrastructure optimally for both*

organisational and societal benefit. We understand a research strategy is currently being developed.

FBA research output has increased since 2017. The research direction is determined by the expertise of the research groups. FBA submitted four research groups for assessment by expert panels. Section 2.1 presents the overall assessments copied from the expert panel reports after spelling and consistency checks.

The quality score of the expert panels varied between 2 and 4 for the groups. The AAMT research group had a clear research strategy focused on understanding biodiversity and ecology in marine ecosystems. It also aimed at using the research results to support the sustainability of economic activities, such as aquaculture, and to provide a solid basis for the educational programmes in aquaculture and marine bioresources. The AAMT research strategy aligns with the University strategy. The other three groups did not clearly articulate their strategy. *The expert panels recommended these groups articulate their research vision and formulate strategies to achieve their vision and maximise impact. This should be in line with the unit-level strategy to ensure all groups contribute to the administrative unit's vision and strategy.*

2.1 Research quality and integrity

Animal Science, Production and Welfare Group – Overall assessment from expert panel 4a

Improving sustainable livestock production and the circular economy are research areas of growing importance and this offers good opportunities to strengthen the group in that area. However, the group is attempting to cover a wide range of topics and disciplines, which hampers its ability to achieve excellence. In addition, there is a lack of strategy. Strategic discussions are needed on research topics, how to foster young researchers, and how to provide a fruitful research environment. The aim to increase external funding is not accompanied with a strategy on how to achieve this. The research activities are very tightly linked to educational activities, which is good from a teaching perspective but may hamper innovative research.
This is a small and young group that lacks an overall strategy and focus, that appears to have been tasked with doing research to support education, and where members conduct research mainly as collaborators, but not as leaders. If the university wants this group to develop its research portfolio, then it should be supported to map out a clear future direction and organised in such a way as to make this more achievable.

Aquaculture and Algae and Microbial Technology Group (AAMT) – Overall Assessment from expert panel 2

The alignment of the research group with the faculty's goals is a strong point. The institution provides AAMT with very good administrative and infrastructure support. The research group has well-structured organisation and workflow and well-balanced staff distribution across different hierarchical positions. The close relationship of the research group with the aquaculture sector guarantees funding sources for highly targeted research. The major weakness of the research group is the narrow scope of the research lines, which might limit growth and sustainability if future global policies change funding priorities towards other research topics. The research quality is based on publications directed at specific research areas, which is good for communication with other researchers and stakeholders but reduces the impact and visibility of outputs. Nonetheless, the research group has made important contributions to the development of innovative solutions for sustainable aquaculture and exploitation of marine resources.

Ecology Group – Overall assessment from expert panel 2

Each of the four full professors have a distinct profile and there is a lack of cohesion and collaboration between the research goals and ambitions. The Ecology Group has two distinctive limbs – marine and terrestrial. There is not much coherence between the terrestrial and the marine sides since they seem to have different strategies and distinct organisational formats. The funding is diverse, but somewhat modest and the low proportion of external competitive funding did raise some concerns amongst the panel. Despite some excellent academic papers, a common strategy and roadmap has not been well presented in the assessment. Teaching and research-supporting teaching is a distinctive feature of the group. The societal role is highlighted by the contribution to IPCC reporting, but this does not characterise the group as a whole. Contribution to Norwegian society is dominated by performing academic teaching, including training of PhD students and postdoctoral fellows.

Genomics Group – Overall assessment from expert panel 4a

The FBA Genomics group is a very strong academic group, with good infrastructure support. The group has a strong focus on fundamental research and the scientific outputs, involving several high-quality papers, substantiate this. The group plays an import strategic role within the University by running the genomics and zebrafish platforms. The modest size of the group makes running a genomics service platform for the University somewhat vulnerable and may make it more difficult to remain competitive in that area in the future. No benchmarks were described for the group in the assessment report. The group appears to be very inwardly focused, which is highlighted by their statement in section 2.3.2.2.2. on knowledge transfer activities, concerning societal contribution: “The unit has no overall agenda concerning user-oriented products, public and private services, collaborations with non-academic partners, and participation in public commissions and advisory groups”. It would appear that the group does not see the necessity to either formulate a proper coherent research strategy, nor do they see any relevance in describing the societal contribution of the group. The evaluation panel saw this as a serious omission, particularly given that Nord University’s value statement indicates that “Nord University will be characterised by the quality of its research and education and by its connectedness: between students and staff, between educational programmes and working life, between research and society”. By failing to engage with the section 2.3.2 of the self-assessment report, the group gave the expert panel the impression that it had not seriously or earnestly engaged with the overall process.

2.2. Open Science

FBA follows the Nord University institutional policy for open access (OA) to publications and research data and implementation of FAIR data principles. Nord University encourages researchers to use journals with open peer-review and OA. Research data management training is available. The OA publication policy states all peer-reviewed, scholarly journal articles crediting Nord University shall be archived in the institutional repository. FBA has made excellent progress in this area, and in 2021 only 5.5% of articles were not open access – down from 36% in 2016. Of the 94.5% openly available in 2021, 42.4% had gold open access and 52.1% available via green open access. This has been achieved via agreements with publishers, university funds for open access, and an institutional repository.

The policy for OA to research data states all research data shall be accompanied by a Data Management Plan (DMP) and research data shall be made openly accessible for further use by all relevant users, except when there are legal, ethical, security-related or commercial reasons for not doing so. FBA deposits field data to different repositories. A noticeable contribution to Nord's institutional repository is the dataset collection on Arctic charr, including videos on its spawning

behaviour (Lake Fjellfrøsvatnet, Northern Norway). Data are archived in DataverseNO, a CoreTrustSeal-certified repository for open research aligned with the FAIR principles. The unit also follows FAIR principles in handling research computer codes, making them available as open-source software in standard repositories like GitHub and using the open-source software R for data analysis.

FBA supports citizen science by organising open research days during early autumn at both campuses. In addition, FBA scientists talk with high school students and life science career options. This is very good.

3. Diversity and equality

Gender: In FBA, the percentage of females at senior levels is lower than the average for the administrative units evaluated in EVALBIOVIT. At full professor level, FBA has 8.5% females, while the average for the administrative units being evaluated in EVALBIOVIT is 27%. At associate professor level, it is 33.5%, again lower than the 52% average for the administrative units being evaluated in EVALBIOVIT. FBA has 12 assistant professors of which 65.7% are female (the average for all administrative units is not available, since the assistant professor job title no longer exists at most administrative units). At researcher and postdoc level, the percentage of females is 29.7%, lower than the 47% average for the administrative units being evaluated in EVALBIOVIT. Of the PhD candidates in FBA, 43.8% are female, again lower than the 65% average for the administrative units being evaluated in EVALBIOVIT. Of the service engineers, 53.8% are female. Overall, the administrative unit has to catch up.

Nord has had a BALANSE project (2018-2021) to consider issues of gender balance. The annual publication rate for females was 0.43 papers per year in 2021 compared to 0.78 per year for males. This is a clear indication that something needs to be done. At the interview, the Committee heard about the *"Professor Programme", a very good mentoring support programme for junior faculty and postdocs where 20-30% then end up writing an independent faculty grant to RCN. This is an example of good practice that could be implemented for other career levels as well.*

Internationality: Having a PhD from outside Norway is used as a proxy measure for internationality. At FBA, 62% of professors, 38% of associate professors, and 47% of researchers have PhDs from outside Norway. Approximately 50% of MSc students are international (teaching is in English), but there are almost no non-EU students because of high fees. FBA has an internationalisation strategy and partnerships with many universities outside Norway. This has led to a doubled BSc intake within a few years, which is impressive, but most BScs are taught in Norwegian, limiting the scope for further growth by internationalisation.

Ethnicity: No specific data are available on ethnicity. We understand from the interview that staff and students from different ethnic groups, including Sami, are well integrated into the FBA community.

Disability: Not all disabilities are visible, but at interview we heard that an FBA staff member with attention deficit hyperactivity disorder (ADHD) was getting workplace support. *FBA should ensure that staff and students are aware of how to access disability support should they need it.*

Age: The age profile in 2021 at FBA is similar to the average for the administrative units evaluated. The average age of professors was 56 (EVALBIOVIT average 58), with 15% over 62 (EVALBIOVIT average 40%). Associate professors average age was 50 (EVALBIOVIT average 49), researchers average age 42 (EVALBIOVIT average 39).

4. Relevance to institutional and sectorial purposes

Nord University was formed in 2016 by the fusion of the University of Nordland (formed in 2011) and two University colleges (Nord-Trøndelag and Nesna). University colleges focus on

undergraduate teaching whilst universities also offer master's and PhD degrees. Nord has a strong reputation in teaching with over 900 students, of which about 800 are undergraduates, 73 master's students, and 59 PhD candidates. It has an established track record of educating a skilled workforce but is a relatively newer player in the research arena. Importantly, FBA includes research projects in all its curricula, which is very good.

The overall goal of FBA is to provide research-based education within the "blue and green growth" strategic area of Nord University, since Nord University aims to be a driving force contributing to the "green shift" agenda of the EU and Norwegian governments. Green transformation of society and business demands new knowledge and methods for managing, cultivating, and extracting natural resources, and FBA aims to provide education to meet these demands. Education offered at FBA covers marine and terrestrial biosciences, including biodiversity, the effects of climate change, animal welfare, and sustainable animal and aquaculture production. Graduates pursue careers in both the public and private sectors, including academia, institutes, regional and national authorities/bodies, and companies e.g. aquaculture feed producers. The Aquaculture group offers both degree-earning and life-long education and conducts research within sustainable aquaculture. The Ecology group focuses on understanding marine and terrestrial ecosystem dynamics (coastal ecology in particular) to inform sustainable resource management. The Animal Sciences, Production and Welfare group focuses on knowledge to underpin green sustainable farming. The Genomics group educates students and performs research that contributes to the administrative unit's knowledge base.

Innovation and commercialisation are organized under a company, Nord Innovasjon AS (NIAS) established by the University. The company's operations are based on a collaboration agreement with Nord University. It was not clear how well this is working for FBA.

5. Relevance to society

FBA's research has high societal relevance, contributing to a wide range of topics covering climate change, sustainable food production, and animal nutrition and health.

FBA submitted 3 impact cases. Much of the research at FBA relates directly to UN Sustainable Development Goals (SDGs) and the Norwegian long-term plan for national and global sustainability. Climate change and loss of biodiversity are grand challenges, and food security is at risk due to both. FBA research aims to address these issues. Also of major relevance to society is the excellent-quality, research-informed teaching to educate and train the next generation for the workplace and for society. Educating about the causes and effects of climate change and involvement internationally via the IPCC contributes to policy changes and is the basis of impact case 1. FBA has industry and stakeholder involvement to make its training relevant to the immediate needs of the region. Improving availability of protein for fish and animal feed is detailed in impact case 2 and improving aquaculture to produce protein for humans underpins impact case 3. The research in impact cases 2 and 3 from FBA is excellently aligned with the Norwegian Feed Mission.

Comments on impact case 1 – Effect of climate change on biodiversity

This impact case is of international importance and is built on the Ecology group's Biogeography and Biodiversity research carried out between 2019 and 2022 and falls within UN SDG 13 (Climate Action). The research directly informed climate change science and policy through assessment of evidence, critical review of the literature, and new analyses of biodiversity data.

This research included looking at the distributions of species since the last ice age and during the last century, until the present. These statistically significant empirical observations, adjusted for sampling effects, confirmed predictions that shifts in marine species distributions would occur due to climate change, particularly ocean warming. The previous IPCC assessments relied on

predictions. FBA research advanced this through accumulating observations of biodiversity, confirming these predictions.

The research contributed to an assessment report of the IPCC Working Group II in 2022. The IPCC is the scientific body commissioned by the countries of the world to report on climate change science under the United Nations Framework Convention on Climate Change (UNFCCC). The IPCC reports directly informed the UNFCCC Conference of the Parties (COP27) where participants prioritised measures to address climate change. These agreements have far-reaching impacts for national economies and human wellbeing in the short- and long-term.

The assessment report's senior author was from FBA, and this contribution was recognised by being a co-recipient of the 2022 "Gulbenkian Prize for Humanity". In addition, it contributed to an invitation to be a lead author of a section of a new "State of the Ocean" report by the Intergovernmental Oceanographic Commission of UNESCO on biodiversity. It is excellent FBA has such a prominent role internationally. The question is *what succession planning is in place in FBA to retain such high-profile contributions?*

Comments on impact case 2 – Sustainable Feeds

The "Sustainable Feeds" impact case research has been carried out since 2012. It encompasses research in FBA with the aim to produce sustainable feed ingredients for fish and farm animal production to produce in turn food for human consumption. Sources of low trophic and environmentally friendly protein include microalgae, macroalgae (seaweed), and insect larvae.

The FBA team has developed a toolbox to test the nutritional value of these feeds and determine the effects on the fish and animals that are fed these new feeds. This has led to successful collaboration with companies. In addition, it has led to very interesting research on whether different feeds can reduce methane production by ruminants and how the animals react to the presence of new ingredients in their diet.

This work has potentially far-reaching implications and impact, both nationally and internationally. This is evidenced by collaborations and joint grants. Given the success of these projects, the administrative unit could attempt to publish reviews of the results in higher-impact journals for more general audiences in addition to technical specialist journals to gain greater international visibility and reputation.

Comments on impact case 3 – Development of epigenetic markers for improved growth of farmed Nile tilapia

The research in impact case 3 was carried out between 2016 and 2021. Commercial fish species are a major source of animal protein worldwide. Selective breeding of commercial fish species is essential to ensure sustainability of the aquaculture sector. Epigenetic mechanisms are emerging as a mechanism of phenotypic variability and plasticity in response to environmental cues. The current molecular approaches used for selection of desired traits in farmed fishes are mainly based on genetic markers and genomic selection without considering the impact of epigenetics.

The EPIFISH team at the Genomics Division studied a cichlid fish, the Nile tilapia, to determine the epigenetic basis of Nile tilapia domestication, with focus on growth-related genes. They showed that major gene expression changes occurred within a single generation of domestication. They discovered that DNA hydroxymethylation in muscle differs significantly between wild fish and their progeny reared in captivity and there was a consistently positive correlation between hydroxymethylation and gene expression levels. This revealed novel biomarkers of growth and they developed molecular assays to identify them to enable selective breeding.

This new approach will contribute towards increased sustainability and profitability of the aquaculture sector, which will have a major societal impact. The results from EPIFISH directly

contribute to the UN Sustainable Development Goals: Zero hunger (SDG2), responsible consumption and production (SDG12), and life below water (SDG14). This is of high impact.

Appendices

List of research groups

Institution	Administrative unit	Research group
Nord University	Faculty of Biosciences and Aquaculture (FBA)	*Animal Science*
		Aquaculture and Algae and microbial Technology
		Ecology
		Genomics

Methods and limitations

Methods and limitations

Methods

The evaluation is based on documentary evidence and online interviews with the representatives of Administrative Unit.

The documentary inputs to the evaluation were:

- Evaluation Protocol Evaluation of life sciences in Norway 2022-2023
- Administrative Unit´s Terms of Reference
- Administrative Unit's self-assessment report
- Administrative Unit's impact cases
- Administrative Unit's research groups evaluation reports
- Panel reports from the Expert panels
- Bibliometric data (*NIFU Nordic Institute for Studies of innovation, research and education*)
- Personnel data (*Statistics Norway (SSB)*)
- Funding data – The Research Council´s contribution to biosciences research (*RCN*)
- Extract from the Survey for academic staff and the Student Survey (*Norwegian Agency for Quality Assurance in Education (NOKUT)*)

After the document review, the Committee met and conducted an initial assessment against the assessment criteria and defined questions for the interview with the Administrative Unit. The Committee shared the interview questions with the Administrative Unit three weeks before the interview.

The Committee interviewed the Administrative Unit in an hour-long virtual meeting to validate the Committee's understanding and refine perceptions as well as fill any gaps in understanding and evidence. The Administrative Unit answered the Committee's questions including any follow-up questions.

After the online interview, the Committee held a meeting to review the initial assessment in light of the interview and draft a report based on their assessment of the Unit against the assessment criteria.

A one-page profile of the Administrative Unit was drafted based on information from the self-assessment. The Administrative Unit had the opportunity to fact-check this profile. Thereafter, the profile was included in the final draft of the report.

The final draft was reviewed by committee members and any comments were addressed. After a final copy-edit, the final report was approved by the Committee.

Limitations

The Committee judged that the Administrative Unit self-assessment report was insufficient to assess all evaluation criteria fully. However, the interview with the Administrative Unit filled gaps in the Committee's understanding, and the information was sufficient to complete the evaluation.

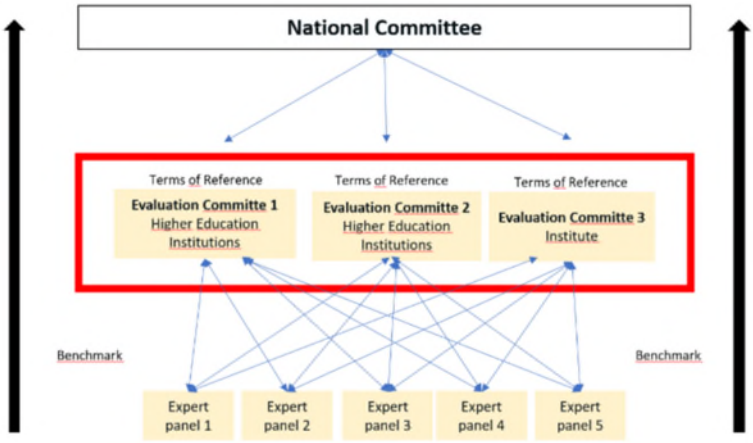
Evaluation of Biosciences 2022-2023

By evaluating Norwegian research and higher education we aim to enhance the quality, relevance, and efficiency. In accordance with the statutes of the Research Council of Norway (RCN), the RCN evaluates Norwegian professional environments to create a solid and up-to-date knowledge base about Norwegian research and higher education in an international perspective.

The evaluation of life sciences is conducted in 2022 - 2024. The evaluation of biosciences takes place in 2022 - 2023, and the evaluation of medicine and health is carried out in 2023-2024. The primary aim of the evaluation of life sciences is to reveal and confirm the quality and the relevance of research performed at Norwegian Higher Education Institutions (HEIs), the institute sector and the health trusts. The evaluation shall result in recommendations to the institutions, the RCN and the ministries.

Evaluation of biosciences (EVALBIOVIT) 2022-2023
The evaluation of biosciences includes twenty-two administrative units (e.g., faculty, department, institution) which are assessed by evaluation committees according to sectorial affiliation and/or other relevant similarities between the units. The administrative units enrolled their research groups (97) to five expert panels organised by research subjects or themes and assessed across institutions and sectors.

Organisation of evaluation of biosciences research 2022 - 2023



The institutions have been allowed to adapt the evaluation mandate (Terms of Reference) to their own strategic goals. This is to ensure that the results of the evaluation will be useful for the institution's own strategic development. The administrative unit together with the research group(s) selects an appropriate benchmark for each of the research group(s).

The Research Council of Norway has commissioned an external evaluation secretariat at Technopolis Group for the implementation of the evaluation process.

Each institution/administrative unit is responsible for following up the recommendations that apply to their own institution/administrative unit. The Research Council will use the results from the evaluation in the development of funding instruments and as a basis for advice to the Government.

The web page for the evaluation of biosciences 2022-2023:
https://www.forskningsradet.no/en/analysis-numbers/evaluations/subject-theme/biosciences/

Til innmeldte administrative enheter til
fagevaluering av biovitenskap (EVALBIOVIT)

Vår saksbehandler/tlf.	**Vår ref.**	**Oslo,**
Hilde D.G. Nielsen/4092 2260	21/10653	21.04.2022
	Deres ref.	

Fagevaluering av biovitenskap (EVALBIOVIT) 2022 – 2023

Vi viser til invitasjonsbrev om å delta i fagevaluering av biovitenskap (EVALBIOVIT) datert 11.11.2021 og til informasjonsmøte med innmeldte administrative enheter 15.12.2021.

Porteføljestyret for livsvitenskap vedtok evalueringsprotokollen for fagevaluering av biovitenskap 05.04.2022 (vedlegg 1). Protokollen beskriver roller, prosesser og ansvarsfordeling i evalueringsarbeidet og er i tråd med forslaget til nytt nasjonalt rammeverk for evaluering av forskning og høyere utdanning utarbeidet i regi av Kunnskapsdepartementet.

Forskningsrådet har mottatt innmelding av 37 administrative enheter til EVALBIOVIT. Disse vil bli fordelt på sektorspesifikke evalueringskomitéer: 1-2 evalueringskomité/er for administrative enheter som tilhører instituttsektoren og 1-2 evalueringskomité/er for administrative enheter som tilhører UH-sektor. Universitetsmuseene vil bli evaluert samlet i én evalueringskomité for UH-sektor.
Det skal i tillegg opprettes internasjonale fagekspertpaneler etter faglig eller tematisk likhet på tvers av sektorer. Ekspertpanelene skal evaluere forskergruppene som de administrative enhetene melder inn. Evalueringskomitéene og ekspertpanelene skal vurdere de innsamlede dataene og gi anbefalinger til den enkelte institusjon, til Forskningsrådet og til departementene.

Tilpasning av mandat (vedlegg 1)

Forskningsrådet ber med dette administrative enheter om å tilpasse mandatet (vedlegg 1) til de lokale forhold ved egen institusjon. Tilpasningen gjøres ved å fylle inn de åpne punktene i malen (Appendix A). Utfylt skjema sendes på epost til evalbiovit@forskningsradet.no *innen 30. september 2022.*

Innmelding av forskergrupper (vedlegg 2a og 2b)

Forskningsrådet ber administrative enheter om å melde inn forskergrupper i tråd med forskergruppedefinisjonen beskrevet i kapittel 1.2 i evalueringsprotokollen. Det bes også om at forskergruppene innplasseres i den tentative fagpanelinndelingen for EVALBIOVIT (vedlegg 2a). Utfylt regneark (vedlegg 2b) sendes til evalbiovit@forskningsradet.no *innen 31. mai 2022.*

Forskningsrådet vil ferdigstille panelstruktur og avgjøre den endelige fordelingen av forskergruppene på fagpaneler *etter* at alle forskergrupper er meldt inn.

Norges forskningsråd/
The Research Council of Norway
Drammensveien 288
Postboks 564
NO–1327 Lysaker

Telefon +47 22 03 70 00
post@forskningsradet.no
www.forskningsradet.no
Org.nr. 970141669

Invitasjon til å foreslå eksperter (vedlegg 3a og 3b)

Forskningsrådet inviterer administrative enheter til å spille inn forslag til eksperter som kan inngå i evalueringskomitéene og i ekspertpanelene (vedlegg 3a). Hver evalueringskomité skal bestå av 7-9 komitémedlemmer. Hvert ekspertpanel skal bestå av 5-7 eksperter. Utfylt regneark (vedlegg 3b, fane 1 og fane 2) sendes til evalbiovit@forskningsradet.no *innen 31. mai 2022.*

Forskningsrådet v/porteføljestyret for livsvitenskap vil oppnevne leder og medlemmer til evalueringskomitéene og til ekspertpanelene.

Data og datainnsamling

Forskningsrådet har nå ute et oppdrag for analyse av data om personal og forskningsproduksjon. Analysen skal i hovedsak baseres på data i DBH, NIFUs forskerpersonaleregister og Cristin. Analysene vil inkludere indikatorer som skal brukes for evaluering av alle institusjoner.

Videre vil institusjonene få et ansvar for innsamling av data til en egenevaluering som skal inngå i vurderingsgrunnlaget for evalueringskomiteene. For å sikre at evalueringen blir nyttig for forskningsinstitusjonenes utvikling, vil Forskningsrådet også invitere institusjonene til å delta i utvelgelse av relevante evalueringsdata og indikatorer som kan danne grunnlag for vurdering opp mot institusjonens egne strategiske mål og sektormål. På bakgrunn av dette har Forskningsrådet en forventning om at institusjonene som deltar i evalueringen stiller med nødvendige ressurser gjennom hele evalueringsprosessen.

Forskningsrådet har, etter en anbudskonkurranse om sekretariatstjenester, inngått en avtale med Technopolis Group som skal bistå Forskningsrådets administrasjon i arbeidet med EVALBIOVIT. Sekretariatet skal blant annet koordinere datainnsamlingen fra institusjonene og systematisere det innsamlede materialet for vurdering i ekspertpaneler og evalueringskomitéer.

Endring av administrativ enhet

For noen få tilfeller kan det være behov for å gjøre noen endringer i forhold til den administrative enheten[1] som allerede er innmeldt til EVALBIOVIT. For eksempel kan et fakultet som ble meldt inn samlet til EVALBIOVIT i desember 2021 finne det mer hensiktsmessig å heller melde inn fakultetets institutter som egne administrative enheter. Hvis man ønsker å endre på den administrative enheten må dette meldes Forskningsrådets administrasjon så fort som mulig, men ikke senere enn 31.05.2022. Melding om endring sendes på epost til: evalbiovit@forskningsradet.no.

Informasjonsmøte 9. mai 2022 og nettside for EVALBIOVIT

Forskningsrådet arrangerer 09.05.2022 kl. 12.00-12.45 et informasjonsmøte for alle som deltar i EVALBIOVIT. Møtet vil foregå digitalt (Zoom). Vi vil i møtet bl.a. gå gjennom evalueringsprotokollen samt at det vil være mulig å stille spørsmål. Påmelding til evalbiovit@forskningsradet.no *innen 07.05.2022.*

Forskningsrådet har opprette en egen nettside hvor informasjon om EVALBIOVIT vil bli publisert fortløpende. Lenke til nettsiden finner dere her: https://www.forskningsradet.no/statistikk-evalueringer/biovitenskap-2022-2023/.

[1] Med administrativ enhet menes en organisatorisk enhet på nivå 2 eller 3 i organisasjonsstrukturen til DBH for UH sektor eller NIFUs organisasjonsregister for institutt- og helsesektoren.

Spørsmål som gjelder fagevalueringen kan sendes på epost til evalbiovit@forskningsradet.no eller ved å kontakte Hilde Dorthea Grindvik Nielsen på epost hgn@forskningsradet.no /mobil 40 92 22 60.

Med vennlig hilsen
Norges forskningsråd

Ole Johan Borge
avdelingsdirektør
Avdeling for helseforskning og helseinnovasjon

Hilde G. Nielsen
spesialrådgiver
Avdeling for helseforskning og helseinnovasjon

Vedlegg
1. Evalueringsprotokoll for fagevaluering av biovitenskap 2022-2023
2a. Tentativ fagpanelinndeling for evaluering av forskergrupper
2b. Skjema for innmelding av forskergrupper
3a. Invitasjon til å foreslå eksperter og informasjon om evalueringskomitéer og ekspertpaneler
3b. Skjema for å foreslå eksperter til evalueringskomitéer og ekspertpaneler

The Research Council of Norway

Evaluation of life sciences in Norway 2022-2023

LIVSEVAL protocol version 1.0

By decision of the Portfolio board for life sciences April 5., 2022

The Research Council of Norway
Visiting address: Drammensveien 288
P.O. Box 564
NO-1327 Lysaker

Telephone: +47 22 03 70 00
Telefax: +47 22 03 70 01
post@rcn.no
www.rcn.no

The report can be downloaded at
www.forskningsradet.no/publikasjoner

Oslo, 5 April 2022

ISBN 978-82-12-Klikk her for å fylle ut (xxxxx-x). (pdf)

1 Introduction

Research assessments based on this protocol serve different aims and have different target groups. The primary aim of the evaluation of life sciences is to reveal and confirm the quality and the relevance of research performed at Norwegian Higher Education Institutions (HEIs), and by the institute sector and regional health authorities and health trusts. These institutions will hereafter be collectively referred to as Research Performing Organisations (RPOs). The assessments should serve a formative purpose by contributing to the development of research quality and relevance at these institutions and at the national level.

1.1 Evaluation units

The assessment will comprise a number of *administrative units* submitted for evaluation by the host institution. By assessing these administrative units in light of the goals and strategies set for them by their host institution, it will be possible to learn more about how public funding is used at the institution(s) to facilitate high-quality research and how this research contributes to society. The administrative units will be assessed by evaluation committees according to sectoral affiliation and/or other relevant similarities between the units.

The administrative units will be invited to submit data on their *research groups* to be assessed by expert panels organised by research subject or theme. See Chapter 3 for details on organisation.

Administrative unit	An administrative unit is any part of an RPO that is recognised as a formal (administrative) unit of that RPO, with a designated budget, strategic goals and dedicated management. It may, for instance, be a university faculty or department, a department of an independent research institute or a hospital.
Research group	Designates groups of researchers within the administrative units that fulfil the minimum requirements set out in section 1.2. Research groups are identified and submitted for evaluation by the administrative unit, which may decide to consider itself a single research group.

1.2 Minimum requirements for research groups

1) The research group must be sufficiently large in size, i.e. at least five persons in full-time positions with research obligations. This merely indicates the minimum number, and larger units are preferable. In exceptional cases, the minimum number may include PhD students, postdoctoral fellows and/or non-tenured researchers. *In all cases, a research group must include at least three full-time tenured staff*. Adjunct professors, technical staff and other relevant personnel may be listed as group members but may not be included in the minimum number.

2) The research group subject to assessment must have been established for at least three years. Groups of more recent date may be accepted if they have come into existence as a consequence of major organisational changes within their host institution.
3) The research group should be known as such both within and outside the institution (e.g. have a separate website). It should be able to document common activities and results in the form of co-publications, research databases and infrastructure, software, or shared responsibilities for delivering education, health services or research-based solutions to designated markets.
4) In its self-assessment, the administrative unit should propose a suitable benchmark for the research group. The benchmark will be considered by the expert panels as a reference in their assessment of the performance of the group. The benchmark can be grounded in both academic and extra-academic standards and targets, depending on the purpose of the group and its host institution.

1.3 The evaluation in a nutshell

The assessment concerns:

- research that the administrative unit and its research groups have conducted in the previous 10 years
- the research strategy that the administrative units under evaluation intend to pursue going forward
- the capacity and quality of research in life sciences at the national level

The Research Council of Norway (RCN) will:

- provide a template for the Terms of Reference[1] for the assessment of RPOs and a national-level assessment in life sciences
- appoint members to evaluation committees and expert panels
- provide secretarial services
- commission reports on research personnel and publications based on data in national registries
- take responsibility for following up assessments and recommendations at the national level.

RPOs conducting research in life sciences are expected to take part in the evaluation. The board of each RPO under evaluation is responsible for tailoring the assessment to its own strategies and specific needs and for following them up within their own institution. Each participating RPO will carry out the following steps:

1) Identify the administrative unit(s) to be included as the main unit(s) of assessment
2) Specify the Terms of Reference by including information on specific tasks and/or strategic goals of relevance to the administrative unit(s)

[1] The terms of reference (ToR) document defines all aspects of how the evaluation committees and expert panels will conduct the [research area] evaluation. It defines the objectives and the scope of the evaluation, outlines the responsibilities of the involved parties, and provides a description of the resources available to carry out the evaluation.

3) The administrative unit will, in turn, be invited to register a set of research groups that fulfil the minimum criteria specified above (see section 1.2). The administrative unit may decide to consider itself a single research group.
4) For each research group, the administrative unit should select an appropriate benchmark in consultation with the group in question. This benchmark can be a reference to an academic level of performance or to the group's contributions to other institutional or sectoral purposes (see section 2.4). The benchmark will be used as a reference in the assessment of the unit by the expert panel.
5) The administrative units subject to assessment must provide information about each of their research groups, and about the administrative unit as a whole, by preparing self-assessments and by providing additional documentation in support of the self-assessment.

1.4 Target groups

- Administrative units represented by institutional management and boards
- Research groups represented by researchers and research group leaders
- Research funders
- Government

The evaluation will result in recommendations to the institutions, the RCN and the ministries. The results of the evaluation will also be disseminated for the benefit of potential students, users of research and society at large.

This protocol is intended for all participants in the evaluation. It provides the information required to organise and carry out the research assessments. Questions about the interpretation or implementation of the protocol should be addressed to the RCN.

2 Assessment criteria

The administrative units are to be assessed on the basis of five assessment criteria. The five criteria are applied in accordance with international standards. Finally, the evaluation committee passes judgement on the administrative units as a whole in qualitative terms. In this overall assessment, the committee should relate the assessment of the specific tasks to the strategic goals that the administrative unit has set for itself in the Terms of Reference.

When assessing administrative units, the committees will build on a separate assessment by expert panels of the research groups within the administrative units. See Chapter 3 'Evaluation process and organisation' for a description of the division of tasks.

2.1 Strategy, resources and organisation

The evaluation committee assesses the framework conditions for research in terms of funding, personnel, recruitment and research infrastructure in relation to the strategic aims set for the administrative unit. The administrative unit should address at least the following five specific aspects in its self-assessment: 1) funding sources, 2) national and international cooperation, 3) cross-sector and interdisciplinary cooperation, 4) research careers and mobility, and 5) Open Science. These five aspects relate to how the unit organises and actually performs its research, its composition in terms of leadership and personnel, and how the unit is run on a day-to-day basis.

To contribute to understanding what the administrative unit can or should change to improve its ability to perform, the evaluation committee is invited to focus on factors that may affect performance.

Further, the evaluation committee assesses the extent to which the administrative unit's goals for the future remain scientifically and societally relevant. It is also assessed whether its aims and strategy, as well as the foresight of its leadership and its overall management, are optimal in relation to attaining these goals. Finally, it is assessed whether the plans and resources are adequate to implement this strategy.

2.2 Research production, quality and integrity

The evaluation committee assesses the profile and quality of the administrative unit's research and the contribution the research makes to the body of scholarly knowledge and the knowledge base for other relevant sectors of society. The committee also assesses the scale of the unit's research results (scholarly publications, research infrastructure developed by the unit, and other contributions to the field) and its contribution to Open Science (early knowledge and sharing of data and other relevant digital objects, as well as science communication and collaboration with societal partners, where appropriate).

The evaluation committee considers the administrative unit's policy for research integrity and how violations of such integrity are prevented. It is interested in how the unit deals with research data, data management, confidentiality (GDPR) and integrity, and the extent to which independent and critical pursuit of research is made possible within the unit. Research integrity relates to both the scientific integrity of conducted research and the professional integrity of researchers.

2.3 Diversity and equality

The evaluation committee considers the diversity of the administrative unit, including gender equality. The presence of differences can be a powerful incentive for creativity and talent development in a diverse administrative unit. Diversity is not an end in itself in that regard, but a tool for bringing together different perspectives and opinions.

The evaluation committee considers the strategy and practices of the administrative unit to prevent discrimination on the grounds of gender, age, disability, ethnicity, religion, sexual orientation or other personal characteristics.

2.4 Relevance to institutional and sectoral purposes

The evaluation committee compares the relevance of the administrative unit's activities and results to the specific aspects detailed in the Terms of Reference for each institution and to the relevant sectoral goals (see below).

Higher Education Institutions

There are 36 Higher Education Institutions in Norway that receive public funding from the Ministry for Education and Research. Twenty-one of the 36 institutions are owned by the ministry, whereas the last 15 are privately owned. The HEIs are regulated under the Act relating to universities and university colleges of 1 August 2005.

The purposes of Norwegian HEIs are defined as follows in the Act relating to universities and university colleges[2]

- provide higher education at a high international level;
- conduct research and academic and artistic development work at a high international level;
- disseminate knowledge of the institution's activities and promote an understanding of the principle of academic freedom and application of scientific and artistic methods and results in the teaching of students, in the institution's own general activity as well as in public administration, in cultural life and in business and industry.

In line with these purposes, the Ministry for Research and Education has defined four overall goals for HEIs that receive public funding. These goals have been applied since 2015:

1) High quality in research and education
2) Research and education for welfare, value creation and innovation
3) Access to education (esp. capacity in health and teacher education)
4) Efficiency, diversity and solidity of the higher education sector and research system

The committee is invited to assess to what extent the research activities and results of each administrative unit have contributed to sectoral purposes as defined above. In particular, the committee is invited to take the share of resources spent on education at the administrative units into account and to assess the relevance and contributions of research to education, focusing on the master's and PhD levels. This assessment should be distinguished from an

[2] https://lovdata.no/dokument/NLE/lov/2005-04-01-15?q=universities

assessment of the quality of education in itself, and it is limited to the role of research in fostering high-quality education.

Research institutes (the institute sector)

Norway's large institute sector reflects a practical orientation of state R&D funding that has long historical roots. The Government's strategy for the institute sector[3] applies to the 33 independent research institutes that receive public basic funding through the RCN, in addition to 12 institutes outside the public basic funding system.

The institute sector plays an important and specific role in attaining the overall goal of the national research system, i.e. to increase competitiveness and innovation power to address major societal challenges. The research institutes' contributions to achieving these objectives should therefore form the basis for the evaluation. The main purpose of the sector is to conduct independent applied research for present and future use in the private and public sector. However, some institutes primarily focus on developing a research platform for public policy decisions, others on fulfilling their public responsibilities.

The institutes should:

- maintain a sound academic level, documented through scientific publications in recognised journals
- obtain competitive national and/or international research funding grants
- conduct contract research for private and/or public clients
- demonstrate robustness by having a reasonable number of researchers allocated to each research field

The committee is invited to assess the extent to which the research activities and results of each administrative unit contribute to sectoral purposes and overall goals as defined above. In particular, the committee is invited to assess the level of collaboration between the administrative unit(s) and partners in their own or other sectors.

The hospital sector

There are four regional health authorities (RHFs) in Norway. They are responsible for the specialist health service in their respective regions. The RHFs are regulated through the Health Enterprises Act of 15 June 2001 and are bound by requirements that apply to specialist and other health services, the Health Personnel Act and the Patient Rights Act. Under each of the regional health authorities, there are several health trusts (HFs), which can consist of one or more hospitals. A health trust (HF) is wholly owned by an RHF.

Research is one of the four main tasks of hospital trusts.[4] The three other mains tasks are to ensure good treatment, education and training of patients and relatives. Research is important if the health service is to keep abreast of stay up-to-date with medical developments and carry out critical assessments of established and new diagnostic methods,

[3] Strategy for a holistic institute policy (Kunnskapsdepartementet 2020)

[4] Cf. the Specialist Health Services Act § 3-8 and the Health Enterprises Act §§ 1 and 2

treatment options and technology, and work on quality development and patient safety while caring for and guiding patients.

The committee is invited to assess the extent to which the research activities and results of each administrative unit have contributed to sectoral purposes as described above. The assessment does not include an evaluation of the health services performed by the services.

2.5 Relevance to society

The committee assesses the quality, scale and relevance of contributions targeting specific economic, social or cultural target groups, of advisory reports on policy, of contributions to public debates, and so on. The documentation provided as the basis for the assessment of societal relevance should make it possible to assess relevance to various sectors of society (i.e. business, the public sector, non-governmental organisations and civil society).

When relevant, the administrative units will be asked to link their contributions to national and international goals set for research, including the Norwegian Long-term Plan for Research and Higher Education and the UN Sustainable Development Goals. Sector-specific objectives, e.g. those described in the Development Agreements for the HEIs and other national guidelines for the different sectors, will be assessed as part of criterion 2.4.

The committee is also invited to assess the societal impact of research based on case studies submitted by the administrative units and/or other relevant data presented to the committee. Academic impact will be assessed as part of criterion 2.2.

3 Evaluation process and organisation

The RCN will organise the assessment process as follows:

- Commission a professional secretariat to support the assessment process in the committees and panels, as well as the production of self-assessments within each RPO
- Commission reports on research personnel and publications within life sciences based on data in national registries
- Appoint one or more evaluation committees for the assessment of administrative units.
- Divide the administrative units between the appointed evaluation committees according to sectoral affiliation and/or other relevant similarities between the units.
- Appoint a number of expert panels for the assessment of research groups submitted by the administrative units.
- Divide research groups between expert panels according to similarity of research subjects or themes.
- Task the chairs of the evaluation committees with producing a national-level report building on the assessments of administrative units and a national-level assessments produced by the expert panels.

Committee members and members of the expert panels will be international, have sufficient competence and be able, as a body, to pass judgement based on all relevant assessment criteria. The RCN will facilitate the connection between the assessment levels of panels and committees by appointing committee members as panel chairs.

3.1 Division of tasks between the committee and panel levels

The expert panels will assess research groups across institutions and sectors, focusing on the first two criteria specified in Chapter 2: 'Strategy, resources and organisation' and 'Research production and quality' The assessments from the expert panels will also be used as part of the evidence base for a report on Norwegian research within life sciences (see section 3.3).

The evaluation committees will assess the administrative units based on all the criteria specified in Chapter 2. The assessment of research groups delivered by the expert panels will be a part of the evidence base for the committees' assessments of administrative units. See figure 1 below.

The evaluation committee has sole responsibility for the assessments and any recommendations in the report. The evaluation committee reaches a judgement on the research based on the administrative units and research groups' self-assessments provided by the RPOs, any additional documents provided by the RCN, and interviews with representatives of the administrative units. The additional documents will include a standardised analysis of research personnel and publications provided by the RCN.

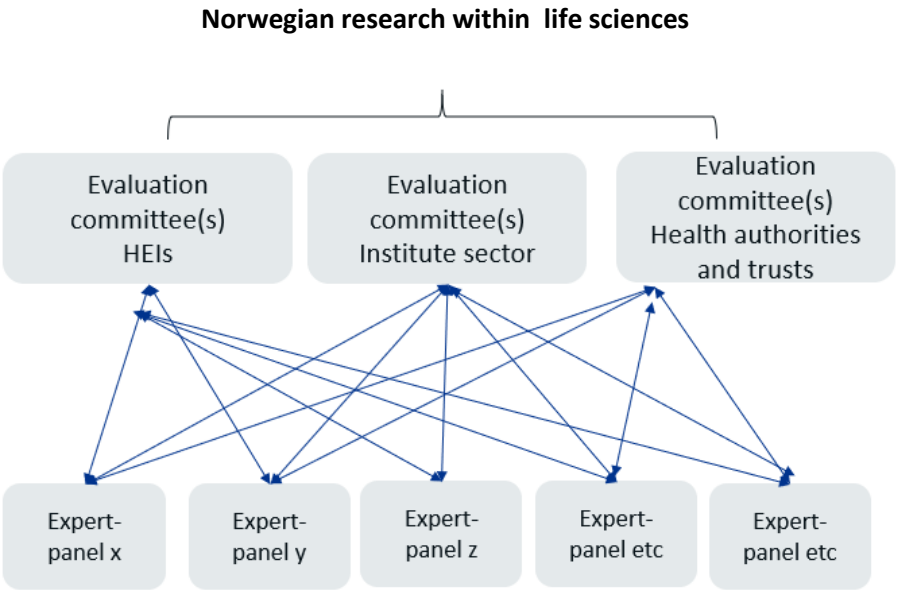


Figure 1. Evaluation committees and expert panels

The evaluation committee takes international trends and developments in science and society into account when forming its judgement. When judging the quality and relevance of the research, the committees shall bear in mind the specific tasks and/or strategic goals that the administrative unit has set for itself including sectoral purposes (see section 2.4 above).

3.2 Accuracy of factual information

The administrative unit under evaluation should be consulted to check the factual information before the final report is delivered to the RCN and the board of the institution hosting the administrative unit.

3.3 National level report

Finally, the RCN will ask the chairs of the evaluation committees to produce a national-level report that builds on the assessments of administrative units and the national-level assessments produced by the expert panels. The committee chairs will present their assessment of Norwegian research in life sciences at the national level in a separate report that pays specific attention to:

- Strengths and weaknesses of the research area in the international context
- The general resource situation regarding funding, personnel and infrastructure
- PhD training, recruitment, mobility and diversity
- Research cooperation nationally and internationally
- Societal impact and the role of research in society, including Open Science

This national-level assessment should be presented to the RCN.

Appendix A: Terms of References (ToR)

[Text in red to be filled in by the Research-performing organisations (RPOs)]

The board of [RPO] mandates the evaluation committee appointed by the Research Council of Norway (RCN) to assess [administrative unit] based on the following Terms of Reference.

Assessment
You are asked to assess the organisation, quality and diversity of research conducted by [administrative unit] as well as its relevance to institutional and sectoral purposes, and to society at large. You should do so by judging the unit's performance based on the following five assessment criteria (a. to e.). Be sure to take current international trends and developments in science and society into account in your analysis.

a) Strategy, resources and organisation
b) Research production, quality and integrity
c) Diversity and equality
d) Relevance to institutional and sectoral purposes
e) Relevance to society

For a description of these criteria, see Chapter 2 of the life sciences evaluation protocol. Please provide a written assessment for each of the five criteria. Please also provide recommendations for improvement. We ask you to pay special attention to the following [n] aspects in your assessment:

1. …
2. …
3. …
4. …

…

[To be completed by the board: specific aspects that the evaluation committee should focus on – they may be related to a) strategic issues, or b) an administrative unit's specific tasks.]

In addition, we would like your report to provide a qualitative assessment of [administrative unit] as a whole in relation to its strategic targets. The committee assesses the strategy that the administrative unit intends to pursue in the years ahead and the extent to which it will be capable of meeting its targets for research and society during this period based on available resources and competence. The committee is also invited to make recommendations concerning these two subjects.

Documentation
The necessary documentation will be made available by the life sciences secretariat at Technopolis Group.

The documents will include the following:

- a report on research personnel and publications within life sciences commissioned by RCN
- a self-assessment based on a template provided by the life sciences secretariat
- [to be completed by the board]

Interviews with representatives from the evaluated units
Interviews with the [administrative unit] will be organised by the evaluation secretariat. Such interviews can be organised as a site visit, in another specified location in Norway or as a video conference.

Statement on impartiality and confidence
The assessment should be carried out in accordance with the *Regulations on Impartiality and Confidence in the Research Council of Norway*. A statement on the impartiality of the committee members has been recorded by the RCN as a part of the appointment process. The impartiality and confidence of committee and panel members should be confirmed when evaluation data from [the administrative unit] are made available to the committee and the panels, and before any assessments are made based on these data. The RCN should be notified if questions concerning impartiality and confidence are raised by committee members during the evaluation process.

Assessment report
We ask you to report your findings in an assessment report drawn up in accordance with a format specified by the life sciences secretariat. The committee may suggest adjustments to this format at its first meeting. A draft report should be sent to the [administrative unit] and RCN by [date]. The [administrative unit] should be allowed to check the report for factual inaccuracies; if such inaccuracies are found, they should be reported to the life sciences secretariat no later than two weeks after receipt of the draft report. After the committee has made the amendments judged necessary, a corrected version of the assessment report should be sent to the board of [the RPO] and the RCN no later than two weeks after all feedback on inaccuracies has been received from [administrative unit].

Appendix B: Data sources

The lists below shows the most relevant data providers and types of data to be included in the evaluation. Data are categorised in two broad categories according to the data source: National registers and self-assessments prepared by the RFOs. The RCN will commission an analysis of data in national registers (R&D-expenditure, personnel, publications etc.) to be used as support for the committees' assessment of administrative units. The analysis will include a set of indicators related to research personnel and publications.

- **National directorates and data providers**
- Norwegian Directorate for Higher Education and Skills (HK-dir)
- Norwegian Agency for Quality Assurance in Education (NOKUT)
- Norwegian Agency for Shared Services in Education and Research (SIKT)
- Research Council of Norway (RCN)
- Statistics Norway (SSB)

National registers

1) R&D-expenditure
    a. SSB: R&D statistics
    b. SSB: Key figures for research institutes
    c. HK-dir: Database for Statistics on Higher Education (DBH)
    d. RCN: Project funding database (DVH)
    e. EU-funding: eCorda
2) Research personnel
    a. SSB: The Register of Research personnel
    b. SSB: The Doctoral Degree Register
    c. RCN: Key figures for research institutes
    d. HK-dir: Database for Statistics on Higher Education (DBH)
3) Research publications
    a. SIKT: Cristin - Current research information system in Norway
    b. SIKT: Norwegian Infrastructure for Bibliometrics
    (full bibliometric data incl. citations and co-authors)
4) Education
    a. HK-dir/DBH: Students and study points
    b. NOKUT: Study barometer
    c. NOKUT: National Teacher Survey
5) Sector-oriented research
    a. RCN: Key figures for research institutes
6) Patient treatments and health care services
    a. Research & Innovation expenditure in the health trusts
    b. Measurement of research and innovation activity in the health trusts
    c. Collaboration between health trusts and HEIs
    d. Funding of research and innovation in the health trusts
    e. Classification of medical and health research using HRCS (HO21 monitor)

Self-assessments

1) Administrative units
    a. *Self-assessment covering all assessment criteria*
    b. Administrative data on funding sources
    c. Administrative data on personnel
    d. Administrative data on the division of staff resources between research and other activities (teaching, dissemination etc.)
    e. Administrative data on research infrastructure and other support structures
    f. SWOT analysis
    g. Any supplementary data needed to assess performance related to the strategic goals and specific tasks of the unit

2) Research groups
    a. *Self-assessment covering the first two assessment criteria (see Table 1)*
    b. Administrative data on funding sources
    c. Administrative data on personnel
    d. Administrative data on contribution to sectoral purposes: teaching, commissioned work, clinical work [will be assessed at committee level]
    e. Publication profiles
    f. Example publications and other research results (databases, software etc.) The examples should be accompanied by an explanation of the groups' specific contributions to the result
    g. Any supplementary data needed to assess performance related to the benchmark defined by the administrative unit

The table below shows how different types of evaluation data may be relevant to different evaluation criteria. Please note that the self-assessment produced by the administrative units in the form of a written account of management, activities, results etc. should cover all criteria. A template for the self-assessment of research groups and administrative units will be commissioned by the RCN from the life sciences secretariat for the evaluation.

Table 1. Types of evaluation data per criterion

Evaluation units / Criteria	Research groups	Administrative units
Strategy, resources and organisation	Self-assessment Administrative data	Self-assessment National registers Administrative data SWOT analysis
Research production and quality	Self-assessment Example publications (and other research results)	Self-assessment National registers
Diversity, equality and integrity		Self-assessment National registers Administrative data
Relevance to institutional and sectoral purposes		Self-assessment Administrative data
Relevance to society		Self-assessment National registers Impact cases
Overall assessment	*Data related to:* *Benchmark defined by administrative unit*	*Data related to:* *Strategic goals and specific tasks of the admin. unit*

Scales for research group assessment

Organisational dimension

Score	Organisational environment
5	An organisational environment that is outstanding for supporting the production of excellent research.
4	An organisational environment that is very strong for supporting the production of excellent research.
3	An organisational environment that is adequate for supporting the production of excellent research.
2	An organisational environment that is modest for supporting the production of excellent research.
1	An organisational environment that is not supportive for the production of excellent research.

Quality dimension

Score	Research and publication quality	Score	Research group's contribution Groups were invited to refer to the Contributor Roles Taxonomy in their description https://credit.niso.org/
5	Quality that is outstanding in terms of originality, significance and rigour.	5	The group has played an outstanding role in the research process from the formulation of overarching research goals and aims via research activities to the preparation of the publication.
4	Quality that is internationally excellent in terms of originality, significance and rigour but which falls short of the highest standards of excellence.	4	The group has played a very considerable role in the research process from the formulation of overarching research goals and aims via research activities to the preparation of the publication.
3	Quality that is recognised internationally in terms of originality, significance and rigour.	3	The group has a considerable role in the research process from the formulation of overarching research goals and aims via research activities to the preparation of the publication.
2	Quality that meets the published definition of research for the purposes of this assessment.	2	The group has modest contributions to the research process from the formulation of overarching research goals and aims via research activities to the preparation of the publication.
1	Quality that falls below the published definition of research for the purposes of this assessment.	1	The group or a group member is credited in the publication, but there is little or no evidence of contributions to the research process from the formulation of overarching research goals and aims via research activities to the preparation of the publication.

Societal impact dimension

Score	Research group's societal contribution, taking into consideration the resources available to the group	Score	User involvement
5	The group has contributed extensively to economic, societal and/or cultural development in Norway and/or internationally.	5	Societal partner involvement is outstanding – partners have had an important role in all parts of the research process, from problem formulation to the publication and/or process or product innovation.
4	The group's contribution to economic, societal and/or cultural development in Norway and/or internationally is very considerable given what is expected from groups in the same research field.	4	Societal partners have very considerable involvement in all parts of the research process, from problem formulation to the publication and/or process or product innovation.
3	The group's contribution to economic, societal and/or cultural development in Norway and/or internationally is on par with what is expected from groups in the same research field.	3	Societal partners have considerable involvement in the research process, from problem formulation to the publication and/or process or product innovation.
2	The group's contribution to economic, societal and/or cultural development in Norway and/or internationally is modest given what is expected from groups in the same research field.	2	Societal partners have a modest part in the research process, from problem formulation to the publication and/or process or product innovation.
1	There is little documentation of contributions from the group to economic, societal and/or cultural development in Norway and/or internationally.	1	There is little documentation of societal partners' participation in the research process, from problem formulation to the publication and/or process or product innovation.

The Research Council of Norway

EVALBIOVIT

Self-assessment for administrative units

Version 1.2

Overview

Institution (name and short name):
Administrative unit (name and short name):
Date:
Contact person:
Contact details (email):

1 Introduction

The primary aim of the evaluation is to reveal and confirm the quality and the relevance of research performed at Norwegian Higher Education Institutions (HEIs), and by the institute sector. For the life sciences area, research undertaken by regional health authorities and health trusts is also included. These institutions will henceforth be collectively referred to as research performing organisations (RPOs). The evaluation report(s) will provide a set of recommendations to the RPOs, the Research Council of Norway (RCN) and the concerned ministries. The results of the evaluation will also be disseminated for the benefit of potential students, users of research, and society at large.

You have been invited to complete this self-assessment as an administrative unit. The self-assessment contains questions regarding the unit's research- and innovation related activities and developments over the past 10 years. All the submitted data will be evaluated by evaluation committees (for administrative units) and expert panels (for research groups). Please read through the whole document including all instructions before answering the questions to avoid overlaps.

As an administrative unit, you are also responsible for collecting the completed self-assessment for each of the research groups that belong to the unit. The research groups need to submit their completed self- assessment to the unit no later than the 1st of December 2022. The unit will submit the research groups' completed self-assessments and the unit's own completed self-assessment no later than the 5th of December 2022.

The whole self-assessment shall be written in English.

Please use the following format when naming your document: name of the institution, and name of the administrative unit, e.g. UiO_FacBiosci. Send it to evalbiovit@technopolis-group.com no later than 5th of December 2022.

For questions concerning the self-assessment or EVALBIOVIT in general, please contact RCN's evaluation secretariat at Technopolis Group: evalbiovit.questions@technopolis-group.com.

Many thanks in advance![1]

[1] Personal information will be deleted when evaluation reports are published and no later than 30 April 2024

For more information on how Technopolis Group handles data processing, see: http://www.technopolis-group.com/privacy-policy/

For more information on how the Research Council of Norway handles data processing, see: https://www.forskningsradet.no/en/privacy-policy/

2 Self-assessment for administrative units

Self-assessment guidelines:

- Data on personnel should refer to reporting to DBH on 1 October 2021 for HEIs and to the yearly reporting for 2021 for the institute sector
- Other data should refer to 31 December 2021 if not specified otherwise
- Please read the entire self-assessment document before answering
- Provide information – provide documents and other relevant data or figures about the administrative unit, for example strategy and other planning documents, as well as data on R&D expenditure, sources of income and results and outcomes of research
- Describe – explain and present using contextual information about the administrative unit (most often this includes filling out specific forms) and inform the reader about the administrative unit
- Reflect – comment in a reflective and evaluative manner how the administrative unit operates
- 4000 characters including spaces equals one page

2.1 Strategy, resources and organisation of research

2.1.1 Research strategy

2.1.1.1 Describe the main strategic goals for research and innovation of the administrative unit (1000–4000 characters). How are these goals related to institutional strategies?

- Describe the main fields and focus of research and innovation in the unit
- Describe how you work to maximise synergies between the different purposes of the unit
- Describe the planned research-field impact; planned policy impact and planned societal impact
- Describe how the strategy is followed-up in the allocation of resources and other measures
- Describe the most important occasions where priorities are made (i.e., announcement of new positions, applying for external funding, following up on evaluations)
- If there is no long-term research strategy – explain why

Form 1 *Administrative unit's strategic planning documents*

Instructions: For each category (Research strategy, Research funding, Cooperation policy, Open science policy) present up to 5 documents that according to you are the most relevant. If the administrative unit uses the strategies, policies, etc. of a larger institution, then present these documents. Please use the following formatting: Name of document, Years active, Link to the document.

Example: Norwegian University of Science and Technology Strategy, 2021–2025, hyperlink to the document

2.1.2 Organisation of research

2.1.2.1 Describe the organisation of research and innovation activities at the unit, including how responsibilities for research and other purposes (education, knowledge exchange, patient treatment, training etc) are distributed and delegated (500–1500 characters).

Form 2 *SWOT analysis for administrative units*

Instructions: Please complete a SWOT analysis for your administrative unit. Reflect on what are the major internal Strengths and Weaknesses as well as external Threats and Opportunities for your research and innovation activities and research environment. Assess what the present Strengths enable in the future and what kinds of Threats are related to the Weaknesses. Consider your scientific expertise and achievements, funding, facilities, organisation and management (500–2000 characters per cell).

2.1.3 Research funding

2.1.3.1 Describe the funding sources of the unit and indicate the share of the unit's budget (NOK) dedicated to research compared to other purposes. Shares may be calculated based on full time equivalents (FTE) allocated to research compared to total FTE in unit (500–1500 characters).

2.1.3.2 Describe how successful the administrative unit has been in obtaining competitive regional, national and/or international research funding grants (200–1000 characters).

Form 3 *Funding levels for the administrative unit for 2021*

Instructions: For administrative units in the institute sector receiving basic funding via RCN, funding levels should be provided for 2021 in the funding categories used in the yearly reporting:

a) National grants (NOK) (post 1.1 og 1.2)):

   i) from the Research Council of Norway (NOK) – excluding basic funding

   ii) from the ministries and underlying directorates (NOK)

   iii) from industry (NOK)

   iv) other national grants including third sector, private associations and foundations (NOK)

b) National contract research (post 1.3)

c) International grants (post 1.4)

d) Funding related to public management (forvaltningsoppgaver post 1.5)

For Higher Education Institutions costs covered by external funding sources should be reported according to the same categories as far as possible. Costs may be classified as Other if they cannot be placed in one of the specified categories. Reporting should be based on incurred costs (regnskapstall) for 2021.

2.1.4 Participation in national infrastructures

2.1.4.1 Describe the most important participation in the national infrastructures listed in the Norwegian roadmap for research infrastructures (Nasjonalt veikart for forskningsinfrastruktur) including as host institution(s) (200–1000 characters).

Form 4 *Infrastructures listed in the Norwegian roadmap for research infrastructures (Nasjonalt veikart for forskningsinfrastruktur)*

Instructions: Please present up to 5 participations in the national infrastructures listed in the Norwegian roadmap for research infrastructures (Nasjonalt veikart for forskningsinfrastruktur) for each area that were the most important to your administrative unit. For each category area, please use the following formatting:

Name of research infrastructure, Years when used, Description (100–500 characters) of the engagement with the research infrastructure (reasoning, objectives, expected/actual outcomes).

[2] Excluding basic funding.

[3] For research institutes only research activities should be included from section 1.3 in the yearly reporting

2.1.4.2 Describe the most important participation in the international infrastructures funded by the ministries (Norsk deltakelse i internasjonale forskningsorganisasjoner finansiert av departementene) (200–1000 characters).

Form 5 *Participation in international research organisations*

Instructions: Please describe up to 5 participations in international and European infrastructures (ESFRI) for each area that have been most important to your research unit. When presenting your participation, please use the following formatting:

Name of research infrastructure, Years when used, Description (100–500 characters) of the participation in the research infrastructure (reasoning, objectives, expected/actual outcomes).

2.1.4.3 Describe the most important participation in European (ESFRI) infrastructures (Norske medlemskap i infrastrukturer i ESFRI roadmap) including as host institution(s) (200–1000 characters).

Form 6 *Participation in infrastructures on the ESFRI Roadmap*

Instructions: For each area, please give a description of up to 5 engagements that have been most important to your research unit. When presenting your participation, please use the following formatting: Name of research infrastructure, Years when used, Description (100–500 characters) of the engagement with the research infrastructure (reasoning, objectives, expected/actual outcomes)."

2.1.5 Accessibility to research infrastructures

2.1.5.1 Describe the accessibility to research infrastructures for your researchers. Considering both physical and electronic infrastructure (200–1000 characters).

2.1.5.2 Describe what is done at the unit to fulfil the FAIR-principles[4] (200–1000 characters).

2.1.6 Research staff

2.1.6.1 Describe the profile of research personnel at the unit in terms of position and gender (200–1000 characters).

Form 7 *Administrative data on the division of staff resources for 2021*

2.1.6.2 Describe the structures and practices to foster researcher careers and help early-career researchers to make their way into the profession (200–1000 characters).

2.1.6.3 Describe how research time is distributed among staff including criteria for research leave (forskningsfri) (200–1000 characters).

2.1.6.4 Describe research mobility options (200–1000 characters).

2.2 Research production, quality, and integrity

2.2.1 Research quality and integrity

2.2.1.1 Describe the scientific focus areas of the research conducted at the administrative unit, including the unit's contribution to these areas (500–2000 characters).

2.2.1.2 Describe the unit's policy for research integrity, including preventative measures when integrity is at risk, or violated (200–1000 characters).[5]

2.2.2 Open Science policies at the administrative unit

2.2.2.1 Describe the institutional policies, approaches, and activities to the following Open Science areas (consider each area separately, 500–1000 characters in total):

- Open access to publications
- Open access to research data and implementation of FAIR data principles
- Open-source software/tools
- Open access to educational resources
- Open peer review
- Skills and training for Open Science
- Citizen science and/or involvement of stakeholders / user groups

2.2.2.2 Describe the most important contributions and impact of the unit's researchers towards the different Open Science areas (consider each area separately, 500–1000 characters in total):

- Open access to publications
- Open access to research data and implementation of FAIR data principles
- Open-source software/tools
- Open access to educational resources
- Open peer review
- Skills and training for Open Science
- Citizen science and/or involvement of stakeholders/user groups

2.2.2.3 Describe the institutional policy regarding ownership of research data, data management, and confidentiality (200–1000 characters). Is the use of data management plans implemented at the unit?

2.3 *Diversity and equality*

2.3.1 Diversity and equality practices

2.3.1.1 Describe the policy and practices to protect against any form of discrimination in the administrative unit (200–1000 characters).

Form 8 *Administrative unit's policies against discrimination*

Instructions: Give a description of up to 5 documents that are the most relevant. If the administrative unit uses the strategies, policies, etc. of a larger institution, then these documents should be referred to. For each document use the following formatting: Name of document, Years active, Link to the document

Example: Norwegian University of Science and Technology Strategy, 2021–2025, hyperlink to the document

2.4 Relevance to institutional and sectorial purposes

2.4.1 Sector specific impact

2.4.1.1 Describe whether the administrative unit has activities aimed at achieving sector-specific objectives[6] or focused on contributing to the knowledge base in general. Describe activities connected to sector-specific objectives, the rationale for participation and achieved and/or expected impacts (500–3000 characters).

- Alternatively, describe whether the activities of the unit are aimed at contribution to the knowledge base in general. Describe the rationale for this approach and the impacts of the unit's work to the knowledge base.

2.4.2 Research innovation and commercialisation

2.4.2.1 Describe the administrative unit's practices for innovation and commercialisation (500–1500 characters).

- Describe the interest among the research staff in doing innovation and commercialisation activities
- Describe how innovation and commercialisation is supported at the unit

Form 9 *Administrative unit's policies for research innovation*

Instructions: Describe up to 5 documents of the administrative unit's policies for research innovation, including IP policies, new patents, licenses, start-up/spin-off guidelines, etc., that are the most relevant. If the administrative unit uses the strategies, policies, etc. of a larger institution, then present these documents. For each document use the following formatting: Name of document, Years active, Link to the document

Example: Norwegian University of Science and Technology Strategy, 2021–2025, hyperlink to the document

2.4.2.2 Provide examples of successful innovation and commercialisation results, such as new patents, licenses, etc (500–1500 characters).

Form 10 *Administrative description of successful innovation and commercialisation results*

Instructions: Please describe up 10 successful innovation and commercialisation results at your administrative unit. For each result, please use the following formatting: Name of innovation and commercial results, Year, Links to relevant documents, articles, etc. that present the result, Description (100–500 characters) of successful innovation and commercialisation result.

2.4.3 Collaboration

2.4.3.1 Describe the unit's policy towards regional, national and international collaboration, as well as how cross-sectorial collaboration and interdisciplinary collaboration is approached at the administrative unit (500–1500 characters). Please fill out the forms that match your institution: the institute sector fills out Form 11a and Form 11b; HEIs fill out Form 12.

- Reflect on how successful the unit have been in meeting its aspirations for collaborations

Form 11a (institute sector) *Administrative unit's partnerships ('faktisk samarbeid')*

Instructions: For each of the administrative unit's tender and project-based cooperation (which are not tax deducted) please present up to 5 examples under each category (Collaboration with national public institutions; Collaboration with national private institutions; Collaboration with international public institutions; Collaboration with international private institutions). Please use 100– 500 characters to describe the impacts and relevance of collaboration.

Form 11b (institute sector) *Administrative unit's collaboration*

Instructions: For each of the administrative unit's tender and project-based cooperation please present up to 5 examples under each category (Collaboration with academic partners nationally; Collaboration with non-academic partners nationally; Collaboration with academic partners internationally; Collaboration with non-academic partners internationally). Please use 100–500 characters to describe the impacts and relevance of collaboration.

2.4.3.2 Reflect on the importance of different types of collaboration for the administrative unit (200–1000 characters).

- Regional, national and international collaborations

Collaborations with different sectors, including public, private and third sector

Form 12 (HEIs) *Administrative unit's partnerships" ('faktisk samarbeid')*

Instructions: For each of the administrative unit's tender and project-based cooperation (which are not tax deducted) please present up to 5 examples under each category (Collaboration with national public institutions; Collaboration with national private institutions; Collaboration with international public institutions; Collaboration with international private institutions). Please use 100– 500 characters to describe the impacts and relevance of collaboration.

2.4.3.3 Reflect on the importance of different types of collaboration for the administrative unit, the added value of these collaborations to the administrative unit and Norwegian research system (500–1500 characters).

2.4.4 ONLY for higher education institutions

2.4.4.1 Reflect on how research at the unit contributes towards master and PhD-level education provision, at your institutions and beyond (200–1000 characters).7

2.4.4.2 Describe the opportunities for master and bachelor students to become involved in research activities at the unit (200–1000 characters).

2.4.5 ONLY for research institutes

2.4.5.1 Describe how the research activities at the administrative unit contribute to the knowledge base for policy development, sustainable development, and societal and industrial transformations more generally (500–1500 characters).8

2.4.5.2 Describe the most important research activities including those with partners outside of research organisations (500–1500 characters).

2.5 Relevance to society

2.5.1 Administrative unit's societal impact

2.5.1.1 Reflect on the unit's contribution towards the Norwegian Long-term plan for research and higher education, societal challenges more widely, and the UN Sustainable Development Goals (500–1500 characters).

2.5.1.2 Describe how the administrative unit's research and innovation has contributed to economic, societal and cultural development by submitting one to five impact cases depending on the size of the unit. For up to 10 researchers: one case; for 10 to 30 researchers: two cases; for 30-50 researchers: three cases; for 50-100 researchers: four cases, and up to five cases for units exceeding 100 researchers. Please use the attached template for impact cases. Each impact case will be submitted as an attachment to the self-evaluation. Institutions that submit impact cases do not have to fill in the box below.

Case no. 1

Thank you for completing the self-assessment.

[7] Please note: RCN will provide data from the national student survey (Studiebarometeret) on students' experience with research methods and exposure to research activities. The data will most probably be on an aggregate level but including the unit under assessment.

[8] Strategi for helhetlig instituttpolitikk, Kunnskapsdepartementet, p.4): «Instituttsektoren skal utvikle kunnskapsgrunnlag for politikkutforming og bidra til bærekraftig utvikling og omstilling, gjennom forskning av høy kvalitet og relevans.» (The government's strategy for an independent institute sector).

Forskningsrådet

Norges forskningsråd
Besøksadresse: Drammensveien 288
Postboks 564
1327 Lysaker

Telefon: 22 03 70 00
Telefaks: 22 03 70 01

post@forskningsradet.no
www.forskningsradet.no

Publikasjonen kan lastes ned fra
www.forskningsradet.no/publikasjoner

Design: [design]
Foto/ill. omslagsside: [fotokreditt]

ISBN 978-82-12-03980-3 (pdf)