Forskningsrådet

Evaluation of Life Sciences 2022-2024

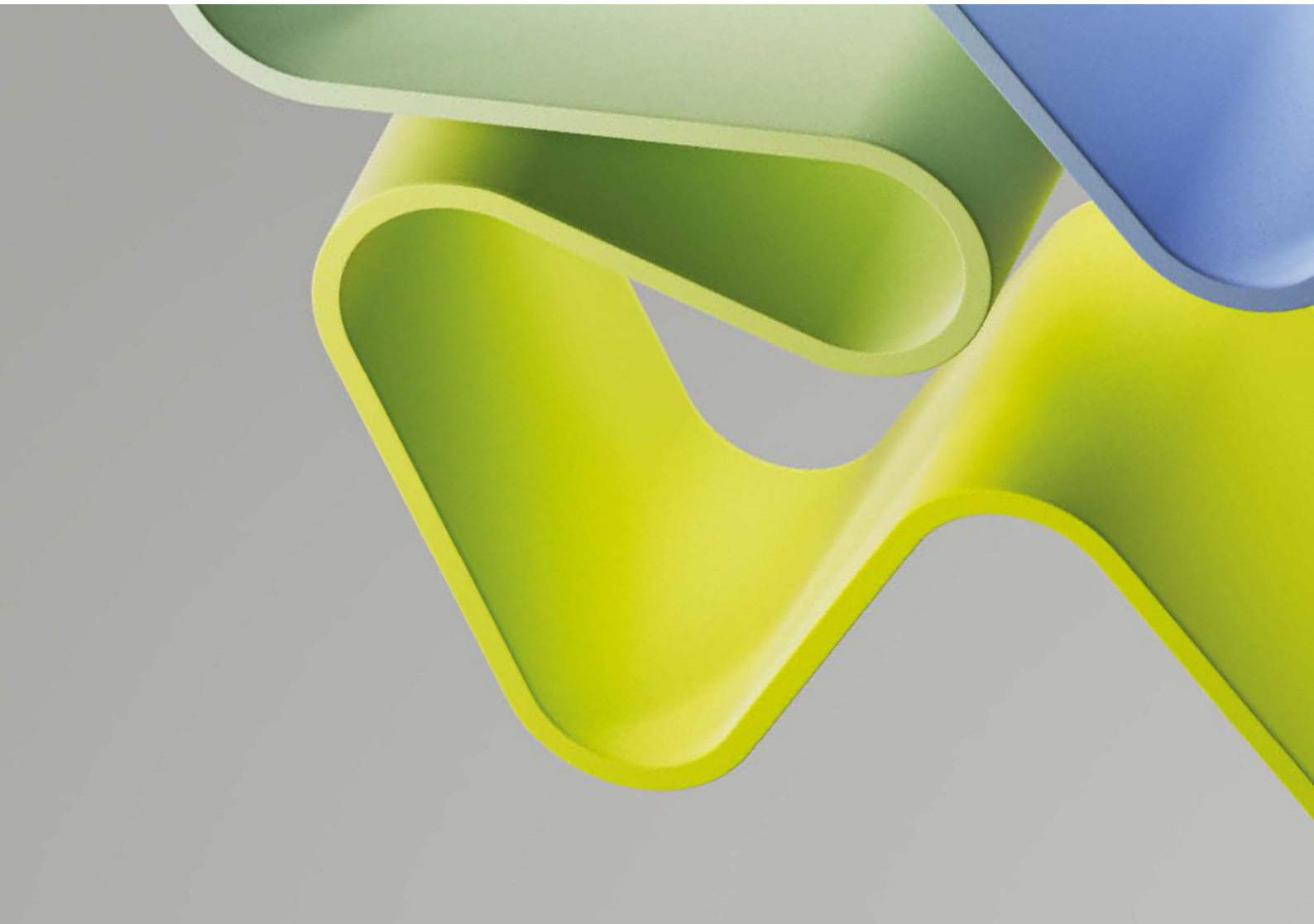
Evaluation of Biosciences 2022-2023

Evaluation report

Department of Biotechnology and Food Science (IBT)

Norwegian University of Science and Technology (NTNU)

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 Administrative 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

As of 2021, the Department of Biotechnology and Food Science (IBT) had a total of 120 employees including 90 academic staff, out of which 35 were PhD students, 12 postdocs, 12 researchers, 15 associate professors, three assistant professors and 13 professors. Women were the majority in all categories, except for professors (30%).

IBT is comprised of three research groups: Biopolymers and Biomaterials, Food Science and Industrial and Environmental Biotechnology.

The overall strategy for the department (2018 – 2025) in the areas of education, research, innovation, communication and the work and study environment, builds on the overarching strategies of the Faculty for Natural Sciences and NTNU. This includes a focus on recruiting, developing and supporting research talents and groups within the administrative unit's fields. According to the self-assessment, IBT focuses on quality in all the administrative unit's activities and is seeking to support transdisciplinarity. IBT's Biopolymers and Biomaterials research group aims to be at the international forefront in understanding and controlling the molecular architecture of biopolymers to harness the full potential of their functional properties and to develop targeted applications. Within the administrative unit's Food Science group, the primary goal is to generate cutting-edge knowledge, improving the utilisation of existing and new raw materials for safe food production in a sustainable way. Sustainable exploration of renewable national resources and biomasses through improved utilisation of marine food resources and their respective side streams is also being pursued. The Industrial and Environmental biotechnology group focusses on better utilisation of renewable raw materials as feedstocks for industrial biotechnology and development of environmental biotechnologies targeting biological processes for water and wastewater treatment. To maximise synergies, the administrative unit has monthly meetings involving the research group leaders and the department leader group.

As a higher education institution (HEI), IBT 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; and efficiency, diversity, and solidity of the higher education sector and research system. As such, IBT in its self-assessment mentions that it conducts both activities aimed at achieving sector-specific objectives and those contributing to the knowledge base in general. Through its research groups, IBT states that it works in the areas of knowledge development, knowledge building, and innovation, and industry collaboration and industrial innovation. IBT's stated aims include application of its research and exploration of possible biobased solutions to address key societal needs in line with the UN´s Sustainable Development Goals. In food science, IBT observes that its main impact is related to activities in education and research and contributions to public and industrial events. Those being trained at IBT are seen by the administrative unit as shaping the next generation of the food industry and public food systems, essential for meeting sector-specific objectives, and building the required knowledge base. In Biopolymer and Seaweed science, the department builds on strong collaborations with Norwegian industry and research institutions to further knowledge and addresses key components of the circular economy.

Based on its self-assessment, in the future IBT might take advantage of the fact that IBT employees include PhD students, postdocs, technical and administrative personnel, as well as permanent scientific staff. The width of the different networks that the employees are part of should give the administrative unit valuable feedback and opportunities to further develop and strengthen its capacities and competences in research, innovation, and education.

Overall assessment

The evaluation committee's overall assessment considering the Terms of Reference provided by the Unit is that the Department of Biotechnology and Food Science of the Norwegian University of Science and Technology (NTNU-IBT) has an excellent reputation for carrying out frontier, cutting-edge basic research within areas of applied relevance which have importance for addressing major global challenges (improved nutrition and health, more efficient use of the bioresources, protecting biodiversity).

NTNU IBT's self-assessment is forward looking and aware that the ability to successfully recruit and retain young talent in two research groups is falling; the situation has dramatically changed over the last couple of years. Another threat is that the salary offered in academic institutions is no longer competitive for recruitment of talent.

The national and international recognition of NTNU IBT's strong position in both research, biotechnology and bio-based solutions, and education can be leveraged for them to become even more visible internationally, which is going to help them attract talent at all career levels and strengthen and grow their portfolio of externally funded projects.

NTNU IBT is in the process of adapting its organisational structure to the changing funding environment, with less core funding for faculty and more strategic projects, which takes time and energy of all staff. It will be challenging to achieve this while remaining attractive as a workplace and successful in recruiting internationally competitively. For this, the administrative unit has a strategy in place for hiring PhD candidates and postdocs. The committee suggests formulation of milestones for monitoring progress.

NTNU IBT is ambitious in both research strategy and recruitment of talent, which gives good perspectives for the future of IBT. All in all, a strong asset for Norway as a whole.

NTNU IBT sees it as a weakness that the research topics and disciplinary diversity are broader than current funding allows. They see it as an inherent risk to be spread too thinly. To address this risk, their strategy is three-fold: (1) To stimulate cross disciplinary research between the many research fields at NTNU IBT; (2) To drive impact for basic research in areas of applied relevance coming higher up in priority for domestic research funding; and (3) To aim at an even stronger externally funded portfolio of projects.

Recommendations

The evaluation committee wishes to extend the following recommendations to the administrative unit, which are constructive suggestions from an outside view on the basis of the information available to the committee and considering the aspects on which recommendations were requested in the terms of reference.

- Use the international recognition of NTNU IBT's strength in basic and applied research, biotechnology, and bio-based solutions strategically to become even more visible internationally, thereby attracting talent and strengthening the portfolio of externally funded projects.
- Continue to work to maximise the impact of fundamental research and prioritise research that is highly translatable and cross disciplinary, providing basis for circular, bio-based technologies and bio-solutions, addressing major (global and local) challenges.
- Use NTNU IBT's strong position to actively contribute to the Norwegian common research infrastructure platforms that are being developed to be cutting edge and for Norwegian researchers to be more active in leading and using EU infrastructure platforms.
- Continue the successful international hiring strategy, but also place more emphasis on retaining local talent for a PhD or postdoc. Maybe the administrative unit needs to increase the number of MSc students in order to achieve this.
- Develop a strategy to align with Faculty initiatives. This can be done with self-confidence given the high international visibility of the administrative unit.
- Develop a strategy for bridging the generational gap with the upcoming retirements of professors. This should include a strategy on future topics and hiring the next generation of faculty. Be creative to attract the best people.
- NTNU IBT has a lot to offer of societal relevance within research-based technologies and innovations within bio-based solutions, addressing major global challenges. A further strengthening of NTNU IBT and public research, innovation, and education in general, contributing to the research-based green muscle for a better world would be a clever investment for Norway.

1. Strategy, resources and organisation of research

NTNU IBT has clear strategic goals and ensures research inspiration and guidance by having a steering committee with three external members. This is excellent.

NTNU IBT sees it as a weakness that their research topics and disciplinary diversity are broader than current funding allows. They see it as an inherent risk to be spread too thinly. To address this risk, their strategy is three-fold: (1) To stimulate cross disciplinary research between the many research fields at NTNU IBT; (2) To drive impact for basic research in areas of applied relevance coming higher up in priority for domestic research funding; and (3) To aim at a stronger externally funded portfolio of projects.

NTNU IBT is strong and successful in attracting and recruiting talent, especially internationally, and creating and maintaining an attractive research environment. This provides the administrative unit with great opportunities for educating talented students, maintaining a well-organised and innovative research environment and a strong portfolio of research, results, and innovations. However, it is still a challenge to keep and recruit key personnel to NTNU IBT. A strategy, milestones and an action plan are needed.

NTNU IBT has an admirable aspiration for an open and collegial style of decision making: "*Twice a semester, we have an extended leader meeting at the department, where we discuss the overall activity and look at the strategy and economy. But the involvement of the research group leaders, and the possibility for everybody to give comments/tips helps the department to move towards its goals*." This is a very good style and should be continued.

1.1 Research Strategy

NTNU IBT has clear strategic goals and ensures research inspiration and guidance by having a steering committee with three external members.

NTNU IBT provides an excellent research environment and follows a strategic approach, planning ahead. This has allowed them to build strong network relations between all groups of staff, including PhD candidates and postdocs. An example of good practice is that they supply add-on funding for promising research and innovation. The administrative unit maintains a strong focus on the importance of Food and Biotechnology for future sustainability. This includes several public/private collaborations as one of the administrative unit's strengths. Also, international collaboration is a focus and given priority as well as considered a strategic strength. This has continuously allowed them to successfully attract students, partners and funding.

NTNU IBT sees it as a weakness that the research topics and disciplinary diversity are broader than funding allows for. This inherently results in a risk of spreading out too thin. Notably IBT strives to make diversity an advantage from the perspective of enabling cross-disciplinary collaboration and being prepared for the future, also in terms of upcoming funding calls.

NTNU IBT is ambitious in both research strategy and recruitment of talent, which is very good for the future of IBT. All in all, the administrative unit is a strong asset for Norway as a whole.

1.2 Organisation of research

NTNU IBT consists of three research groups: Biopolymers and Biomaterials, Food Science, Industrial and Environmental Biotechnology. The administrative unit has the potential and courage to shape its research group structure when needed and is on track to complete the merger between Food Science and Biotechnology, albeit challenges remain.

NTNU IBT's excellent reputation for carrying out frontier, cutting-edge basic research within areas of applied relevance can be leveraged for it to become even more visible internationally, which is going to help attract talent at all career levels and strengthen and grow the portfolio of externally funded projects.

The Research Group leaders are responsible for overseeing the activities in the groups. The 50% research and 50% teaching time split provides the basis for a good research environment. Professors and associate professors are responsible for supervising MSc students and PhD candidates, as well as for mentoring postdocs and securing external funding.

NTNU IBT is in the process of adapting its organisational structure to the changing funding environment, with less core funding for faculty and more strategic projects, which takes time and energy of all staff. It will be challenging to achieve this while remaining attractive as a workplace and successful in recruiting the best. For this, the administrative unit has a strategy and milestones in place for hiring PhD candidates and postdocs.

It is recommended that considering these changes in the funding environment, the administrative unit thinks carefully about how to integrate and benefit from strategic projects and funds of the faculty. For this it will be important that the administrative unit is well networked into the faculty and establishing an international scientific advisory board to inspire the strategic research vision of NTNU IBT as an add-on to the existing external advisory board (representing users of NTNU IBT knowledge) could help.

1.3 Research funding

The administrative unit currently has 40% external funds, whereas 60% are public university funds (40% basic funding + 10% for students + 10% for strategic research). This documents their success in attracting external funding, but this is still relatively low in international comparison. They have been successful in winning EU funding. The administrative unit aims to increase its external funding level. The basis for this will be to ensure all research groups are internationally competitive and contribute toward this goal.

At the same time, the administrative unit sees it as a serious threat that core funding is decreasing for both the faculty and the administrative unit. This has already led to decreasing numbers of PhD candidates and postdocs. That most funding opportunities are only two-year grants, whereas a PhD degree takes three years has been identified as a potential structural problem. Another structural obstacle is that PhD candidates cost the same as postdocs, while requiring more mentoring, which requires more staff input and thus placing them at a disadvantage.

The administrative unit worries that Norwegian research funding from both the ministry and RCN is moving from basic research towards more applied research. However, reducing funding for basic research may erode the educational and scientific basis for being able to perform applied research. The administrative unit has been very successful in attracting external funding for projects combining basic and applied research.

The administrative unit's strong position to contribute significantly to the new Norwegian Feed Mission presents them with a clear opportunity, but the administrative unit still has to see how this new initiative will be implemented.

1.4 Use of infrastructures

NTNU provides excellent infrastructure and facilities for IBT to perform its research. Staff have access to laboratories in addition to infrastructure for systems biology and computational work. The high-performance computing cluster at NTNU provides an important in-house resource for the administrative unit. This allows the administrative unit to host the Centre for Digital Life Norway, funded by the RCN.

Together with the Universities of Oslo and Bergen, NTNU IBT is hosting NNP – the Norwegian Nuclear Magnetic Resonance (NMR) Platform. Nearly all research with a molecular focus benefits from having access to state-of-the-art NMR infrastructure. In addition, NTNU is a node in ELIXIR.NO and the administrative unit led a work package in systems biology there from 2018-2022.

NTNU-IBT sees the distributed research infrastructure in Norway, originally initiated by the FUGE (functional genomics research) strategy and funding activities, as a very strong asset and a well-functioning system. IBT has plans for applying for two additional national infrastructures, one in mass spectrometry and one for food science equipment. Their goal is to build facility collaborations in Norway rather than competition, which is a very good goal that is also aligned with the national FUGE strategy.

1.5 National and international collaboration

NTNU IBT is very well known internationally. NTNU IBT's reputation is based on frontier, cutting-edge science in biotechnology. NTNU IBT has a strong portfolio of national and international research collaborations.

NTNU IBT's reputation and recruitment power could possibly be a benefit also for Norwegian university institutes which have difficulties in recruiting experienced talent, for example, if specific grants could be given to visiting professors having double affiliations.

NTNU IBT is involved in, and also actively contributes to, and in some cases takes leadership responsibilities for an extensive portfolio of international and domestic collaborations. To mention a few:

- ELIXIR.NO, the Norway ELIXIR node, established 2018-2022. There are continued activities, of high relevance for NTNU IBT research, innovation, and education
- NNP, the Norwegian NMR Platform. This platform is being used, not just by NTNU IBT but is open to all universities in Norway, for studying structure, function and dynamics of proteins and polysaccharides at the atomic level. Notably, NMR is a key characterisation technique in many of the externally funded projects.

Access to this infrastructure directly increases the chances for Norwegian research in competing for international grants. Besides the above, NTNU IBT has many other connections and collaborations to relevant HEIs, showing a strong and proactive and collaborative profile.

1.6 Research staff

Almost all research personnel work 50% of their time in research, and 50% in education.

At NTNU there is a common policy for sabbaticals, which are incorporated into the long-term research strategy, HR policy and education strategy. All permanent academic staff in academic posts in the categories professor, associate professor and assistant professor are entitled to apply for a one-year sabbatical after 4 years of qualifying service or a half-year sabbatical after 2 years of qualifying service. This is very generous.

Financial resources are available for visits abroad, and NTNU offers comprehensive and professional guidance for academic staff on long-term visits abroad.

Nevertheless, the administrative unit is seeing its ability to successfully recruit and retain decrease. They see it as a dramatically changed situation over the last couple of years. Another threat is that the salary offered in academic institutions is no longer competitive for recruitment of the best.

When open positions at NTNU IBT are advertised, they generally attract high numbers of applicants. While the applicants are both domestic and international, there are generally few from "western" countries. NTNU IBT is a popular destination for international researchers, and NTNU IBT considers having more emphasis on raising local talent for PhD positions and postdocs. In general, all MSc graduates immediately get jobs in industry, possibly creating an issue for recruiting PhDs. Perhaps more MSc students could be trained.

Many professors are retiring soon. Therefore, a clear strategy is needed for how to bridge this generational gap and leverage the generation renewal. This should be part of a larger strategy on future research topics and hiring of the next generation of faculty. IBT should be creative to get the best people.

2. Research production, quality and integrity

The NTNU-IBT administrative unit has been and still is performing very high-quality research. The research output significantly increased after 2020, but the mean normalised citation score (MNCS) leaves room for improvement given the very high marks the expert panel gave to the research groups (NIFU analysis, MNCS 119 in 2019 and 86 in 2020 lower than Norwegian average of 120). The administrative unit is advised to think of ways for increasing the impact and quality of the scientific output, which would also positively affect their international visibility.

The evaluation of the research groups' performance by the expert panels varies between groups. The Biopolymers & Biomaterials group is ranked outstanding with top marks in all categories. The group on Industrial & Environmental Biotechnology is rated as competitive with overall high to very high marks (outstanding in two out of three categories). The administrative unit should find ways to strengthen and support all groups, reorganise the group structure, or strengthen cross-group synergies, in order to ensure all groups are strong and contribute to the standing and performance of the administrative unit.

A step in this direction could be the establishment of shared core resources and infrastructures used across groups, or structural incentives for cross-group collaboration creating more focus and critical mass.

2.1 Research quality and integrity

Biopolymers & Biomaterials – overall assessment by Expert Panel 4a

The Biopolymers and Biomaterials Research Group is outstanding with respect to its research activities and outputs which are clearly internationally leading in the area of marine polymer research. Their research activities go far beyond pure polymer research, as they perform extensive studies on the enzymes/proteins connected to the marine polymers in addition to applied questions with a focus on medical and material science applications.

Their ambitious strategic research goals match their activities. They clearly articulate their future research goals; both in terms of leadership and group membership. The group is embedded in a top-class scientific environment and is well connected and responsible for different national facilities.

The third-party funds raised are clearly above average and cover a wide range of sources. However, it should be noted that a further enlargement of the group is 'depending on department economy'.

Without knowledge of all the organisational details within the group (currently there seems to be a generational change in the group), the number of graduating PhD students is comparably low in relation to the clearly high scientific output and the number of principal investigators (PIs) within the group. Also there may be some concerns about how the group will be able to recruit top level scientists into the different science areas – a clear strategy is required and should be encouraged in order to establish both PhD student and postdoctoral researcher training programmes to provide trained personnel, thereby helping to overcome any potential future bottlenecks of personnel in these areas, both from an academic and industrial biotechnology perspective in academia and in the developing biotech industry.

Food Science research group – overall assessment by Expert Panel 4b

The group is a result of a merger several years ago and is still in the consolidation phase with a broad portfolio in the food sciences. Its output is mainly competitive at the national level. The group has an ambitious excellence strategy, but clear milestone definitions are missing. Hence this should be addressed in addition to the need for solving the uneven distribution of education and research tasks across the staff. In all these areas focus and critical mass would help reach the goals. In other words, the group needs to propose an impact strategy going forward.

Industrial and Environmental Biotechnology research group – overall assessment by Expert Panel 4a

The group is clearly competitive in a number of its research areas in an international context and is a leader in many of these research areas nationally. The nature of the work being undertaken in the circular bioeconomy and sustainability areas by the group involving both basic and applied aspects within these domains, makes them an attractive administrative unit with which to collaborate from the perspective of industry and academic groups, both nationally and internationally. They have recently recruited a number of scientifically very strong international PIs and coupled with the very clearly articulated strategic plan of the group, this augers well for their future sustainability. However, while the group publish in good quality international peer reviewed journals, the overall quality of the research outputs from the group are not commensurate with the size (59 people) and scientific quality of the group. The group should strive to publish their research outputs in higher profile scientific journals, to further highlight the research being undertaken. The group's work in the bioeconomy area has high societal relevance and given their interest in global and national societal challenges relating to food and feed, water, the environment and health; their work will continue to be of high societal relevance in the future.

2.2. Open Science

The number of scientific papers published in peer-reviewed Journals by NTNU IBT is growing; in recent years the number of papers published are: 62 in 2019; 103 in 2020; and 105 in 2021.

NTNU IBT follows a code of conduct in relation to Open Science by preferentially publishing in open access journals. The ratios of publications published as Gold open access were: 24% in 2016; 46% in 2017; 35% in 2018; 40% in 2019; 48% in 2020; and 45% in 2021. In addition to Gold open access, in 2021 28% of publications were published as green open access and 27% were self-archived. Therefore, in summary, all research publications of the administrative unit were openly available. This is remarkable.

It may be a challenge for the administrative unit to maintain this with the fees for publication in Open Science formats growing drastically and many of the research projects granted not having sufficient budget for covering the fees for publishing Open Access. This may require attention going forward.

NTNU IBT follows the FAIR principles in data handling (Findable, Accessible, Interoperable, and Reusable). Knowledge is to be available, accessible, and re-usable in order to be fair. NTNU IBT makes sure that researchers and students have access to suitable services and infrastructures for secure storage and sharing research data.

3. Diversity and equality

NTNU IBT has managed to develop a very inclusive research and education environment, welcoming all talents and supporting and promoting collaboration across all segments and nationalities.

NTNU IBT has had excellent success in recruiting young researchers and students from many different types of talent, countries, and societal backgrounds. This is clearly outstanding.

Domestic and international recruitment is also successful, creating a very international research and education environment at NTNU IBT. However, recruiting from the most highly reputable EU/UK/US research environments is lower. This could be an issue. But the NTNU IBT strength should be sufficient to counteract this by stronger proactive promotion into these markets.

The gender ratio in NTNU IBT is facing the same dilemma as most biological research organisations: Very low ratio of female full professors; and a trend towards males being a minority among the new students. Biological research as well as health and medicine attract more of the female gender. Strategies are needed for both the senior and the junior levels to maintain a balance.

The number of publication authorships for NTNU IBT, calculated for women and men separately, has the following trend:

- In 2018 women and men published approximately the same number of scientific papers.
- In 2020 female scientists published significantly more papers than their male colleagues.
- In 2021 the number of papers published by men and women were again about the same.

4. Relevance to institutional and sectorial purposes

As a higher education institution, NTNU IBT strives to follow the four overall goals for Norwegian HEIs (receiving public funding): “High quality in research and education; research and education for welfare, value creation and innovation; access to education; and efficiency, diversity, and solidity of the higher education sector and research system”.

NTNU IBT in their self-assessment highlight that they give priority to conducting activities aimed at both achieving sector-specific objectives and contributing to the knowledge base in general. Through its research groups, NTNU IBT states that it works in the areas of knowledge development, knowledge building, and innovation, and industry collaboration and industrial innovation.

NTNU IBT plays a prominent role in the sector of Food Science (research and development) in Norway. NTNU IBT graduates are attractive for and get employed in the industrial food sector in Norway.

NTNU IBT research within the societal sector of Biopolymers and Biomaterials develops and fulfils the frontier role of making seaweed a preferred feedstock for new biobased materials, substituting for fossils. This work in Norway is among the absolute pioneers in the field and started as early as 1949.

NTNU IBT research within industrial and environmental biotechnology is a major player in the circular biobased Norwegian economy and is also serving a prominent role internationally in this sector, by pioneering cutting-edge research with a significant climate-change mitigation role, e.g., in utilising methanol and CO_2 (syngas) as alternative feedstocks for microbial production and microbial conversion. This all comes together in favouring improved use of global resources.

5. Relevance to society

NTNU IBT work with and towards the UN Sustainability Development Goals (SDGs), especially focusing on SDGs 2, 3, 4, 8, 12, and 14.

NTNU IBT has been very successful in founding spin-out and start-up companies. Industrial collaboration is strong and the close relationship with users of their knowledge is a strength. NTNU IBT has some industrial PhDs, but not many. This is not a problem, since NTNU IBT has been efficient in spinning out new startups, several of which are successful and growing.

NTNU IBT has a green campus strategy and focusses research on environmentally relevant topics. This is a strong signal to the local community and a message to all staff and students, to see that there are no double standards and there is a clear coherence between research objective and NTNU IBT practices.

The central technology transfer office of NTNU, NTNU TTO, evaluates the potential of innovations. However, the NTNU IBT research staff also have good knowledge and experience in patenting and IP management. Together this functions very well, as already discussed above.

There is, however, a need for a stronger sense of urgency with regard to contributing even more to addressing the major global (and local) challenges: climate change, biodiversity, healthy sea, healthy agriculture, and more healthy food for improved public health. NTNU IBT has a lot to offer in this area. Strengthening NTNU IBT and other parts of public research, innovation and education contributing to the research-based green muscle for a better world would be a clever investment for Norway.

It also operates from a strong position to contribute significantly to the new Norwegian Feed Mission, a clear opportunity for the administrative unit. However, IBT still has not seen how this new initiative will be implemented.

The list of NTNU IBT inventions of societal relevance is long. Several of the new achievements and new technologies are patented and a selection of these are also licensed out to companies. Notably, patents are also published, meaning that patent literature is a strong knowledge base of inspiration for new researchers to do their inventions.

Comments on Impact case 1 – Spin-off Syngens A/S

The spin-off Syngens A/S was established in November 2020 and operates at the intersection of Artificial Intelligence (AI) and Synthetic biology. They integrated synthetic biology with AI, resulting in a machine learning-based DNA design platform, which is a formidable example of the power of interdisciplinary research at the administrative unit. Transcriptional and translational regulation in microorganisms has been a focus of Lale's group. The Molecular Biology division has a strong record in bacterial gene expression. The research group of the late Svein Valla (2013), highly internationally reputed, led to Vectron Biosolutions in 2008. Valla was one of the pioneers within mRNA research and development. Several grants have been critical in this context, e.g. the NTNU Biotechnology programme, an EU-Horizon 2020 project, an NTNU Discovery Pilot project, an Engineering and Physical Sciences Research Council (UK) project and the RCN-FORNY 2020 project.

In terms of impact, Lale's group has contributed to several collaborative efforts with Syngens A/S in publications, in international/EU and national grant applications, in mobility and training of researchers (thus providing them with better opportunities on the scientific job market). Syngens A/S contributes to several UN SDGs (e.g. SDG 8, 9, and 12). Moreover, Syngens A/S received the Adolf Oiens's start-up award in 2021, a commercialisation grant form Innovation Norway and a NTNU-TTO license agreement.

Comments on impact case 2 – Concordix, dosable neutra- and pharma-ceuticals.

Concordix (CCx) is a chewable technology, developed and patented by IBT, for oral administration of neutra- and pharmaceuticals with specific formulations, meanwhile manufactured and produced by Vitux A/S (70 FTEs). The CCx technology is covered by 20 patents and the products are widely marketed by Vitux A/S in Oslo, with manufacturing sites in several other countries. IBT's knowledge and expertise in biopolymer materials, emulsions, emulsion stabilisation and drug delivery has been the underlying scientific basis. The first patent application was filed in 2007, and the first product reached the market in 2011. Taste masking CCx formulations for ibuprofen constitute an example. The development of plant-based gelling agents instead of animal-based gelatin appeared to be crucial.

Beneficiaries of the CCx technology and commercialisation are the Norwegian economy, Vitux A/S customers and end-users in Norway and beyond. Further research and development are ongoing in IBT and via commercial collaborators. For example, chewable dosage forms for the treatment of Alzheimer's disease patients have been tested. CCx products have significant advantages over traditional gummies, including loading capacity and multiple active ingredients, compartmentalised and with improved bioavailability. Beyond the economic and customer impact, the research is also used as a case study for NTNU students, e.g. in a course on 'Biological and commercial barriers to getting drugs into patients.

Comments on impact case 3 – Biomass from Norwegian fishery and Aquaculture for human food and ingredients

Over the years, the administrative unit has provided research and education on handling and processing seafood to improve quality, safety and shelf life to improve the seafood sector's sustainability as well as to obtain related commercial processes. In multiple projects, e.g. OPTiMAT, SGS-Concept, Prohealth, SUPREME and OMEGA, the Food Science division has contributed to optimisation of the under-utilisation of biomass and the use of low-value products.

This impact case is of relevance for Norwegian society, both locally, regionally and across the country. It is enabling new strategies for producing food, feed ingredients and nutraceuticals. Moreover, many MSc students and PhD candidates completed relevant work in this context and took relevant jobs in the sector. The staff of the administrative unit also contributed to improved utilisation of marine raw materials for human foods, in collaboration with research institutes like Nofima A/S and Sinteff, often in close collaboration with industry. A number of publications and externally funded projects have also benefitted from this research.

Finally, the NTNU Food Forum was established in 2020, an ambitious multidisciplinary forum for fair, healthy and sustainable food (and feed) systems. Also starting the Norway food festival was instrumental for winning the EU award as European region of Gastronomy.

Appendices

List of research groups

Institution	Administrative unit	Research group
Norwegian University of Science and Technology (NTNU)	Department of Biotechnology and Food Science, IBT	*Biopolymers and Biomaterials*
		Food Science
		Industrial and Environmental biotechnology

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 Administrative 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 the information received through documentary inputs and the interview with the Administrative unit sufficient to complete the evaluation.

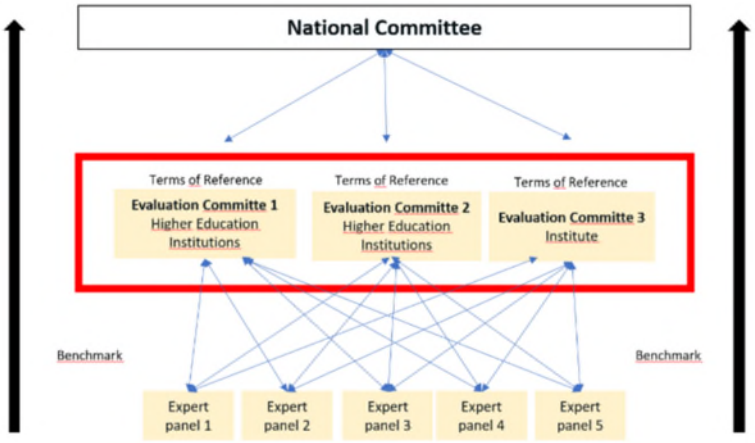
Evaluation of Biosciences 2022-2023

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

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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.

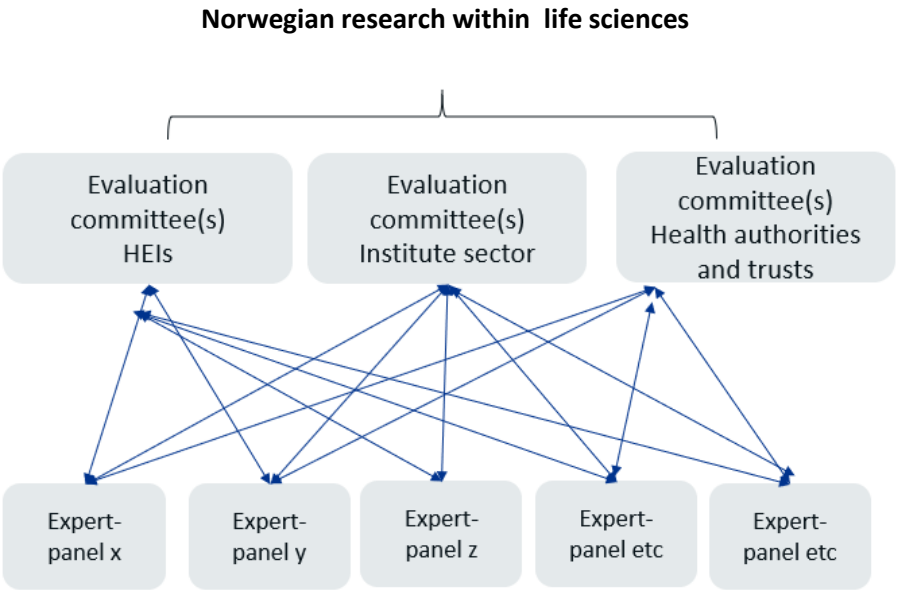

Figure 1. Evaluation committees and expert panels

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).

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