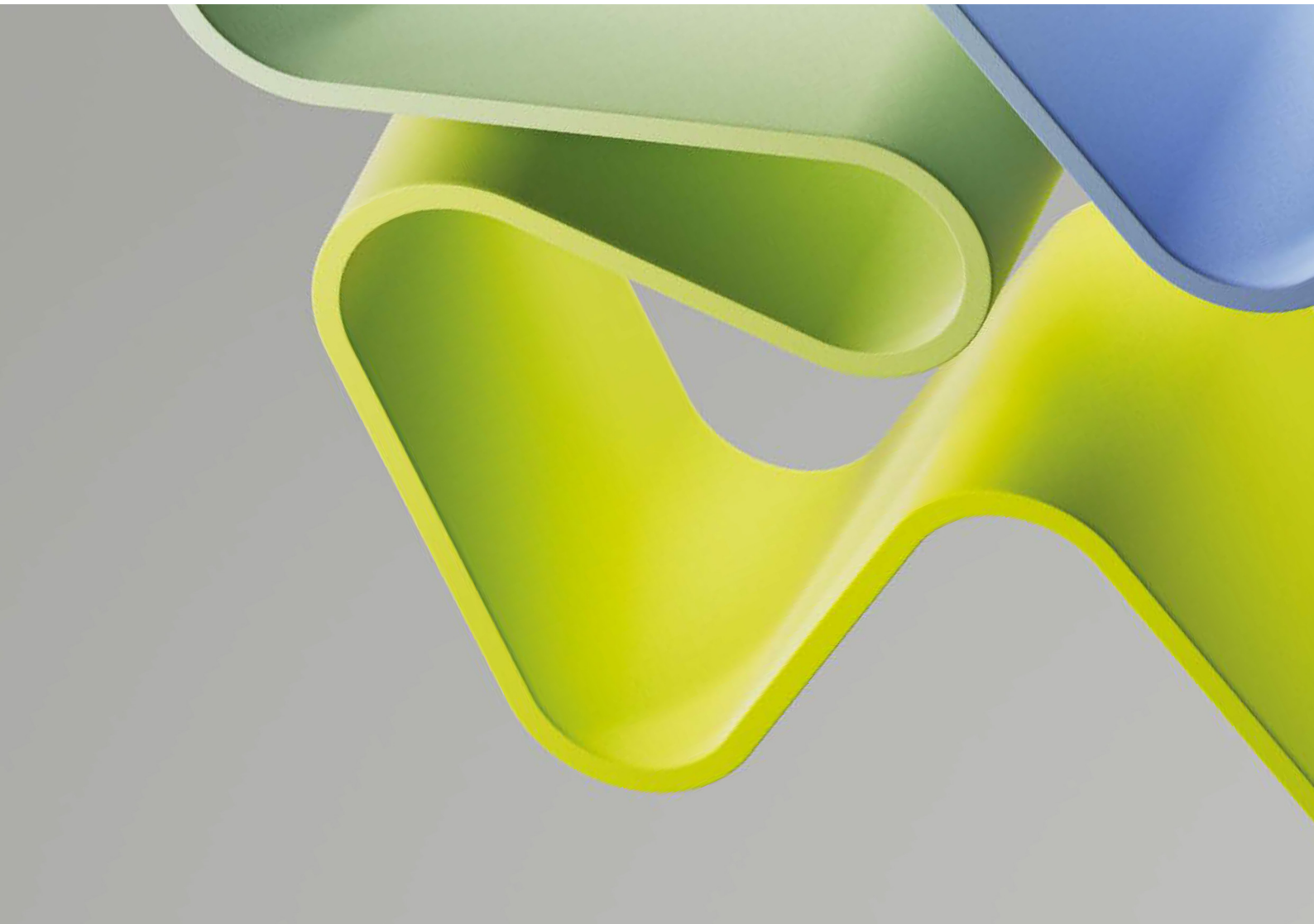
The Research Council of Norway

Evaluation of Medicine and Health 2023-2024

Evaluation report – Panel 1a
Research Group: Chemistry toxiology (KMKT)
Administrative Unit: Division of Climate and Environmental Health
Institution: Norwegian institute of Public Health



Content

Preface

The Research Council of Norway (RCN) is given the task by the Ministry of Education and Research to perform subject-specific evaluations. The primary aim of the evaluation of medicine and health (EVALMEDHELSE) 2023-2024 is to reveal and confirm the quality and relevance of research performed at Norwegian Higher Education institutions, research institutions (the institute sector) and the health trusts, in an international perspective. Such knowledge is useful for the institutions that participate in the evaluation, for the Research Council who advice the authorities on how research should be developed further, and for the authorities, who set targets and frameworks for research and higher education. Research groups submitted by their administrative unit will be assessed by 18 expert panels organised by research subjects or themes. The expert panels will assess research groups across institutions and sectors based on research group's self-assessments and examples of scholarly output. These research reports will be part of the evaluation of their belonging administrative units.

Abstract

The Chemical Toxicology research group at the Norwegian Institute of Public Health is a leading national competence centre specialising in chemical hazards and human toxicology. Its multidisciplinary environment has secured substantial external funding from national and international sources. The group actively informs national and international policy by participating in regulatory frameworks and advisory roles, translating its research into practical guidance on the health effects of chemicals. Its involvement in European projects further underscores its impact on the international scientific community. The group publishes in high-impact journals, reflecting its excellence in research quality. Its societal impact is largely based on translating scientific findings into practical advice for policymakers and the public. Its contribution in shaping national chemical strategies and nuclear incident preparedness highlights its importance to public health policy. Benchmarking against similar research groups, the Chemical Toxicology group stands out for its strong research quality, evidenced by its publications and its influential role in national and international regulatory matters.

Overall assessment

The Chemical Toxicology research group is well-structured and has effectively secured external research funding from various sources. The group has access to a range of advanced analytical platforms and core facilities. The group's dual focus, on research and advisory services, aligns closely with institutional strategies. The organisational environment is adequate to promote high-quality research, but the group's contribution to education is limited. The group demonstrates a high level of scientific quality, as evidenced by its diverse project portfolio and publications in high-impact journals. All senior PIs have good publication track records. The group demonstrates strong international cooperation and interdisciplinary collaboration. The group serves as a national competence centre for human toxicology. Finally, the group has strong emphasis on translating scientific findings into practical advice for policymakers and the broader public. Their involvement in formulating national chemical risk strategies and nuclear incident preparedness underscores their vital role in public health policy. User involvement is somewhat limited.

Grading:

Dimensions	Score
Organisational dimension (How adequate the organisational environment is in supporting the production of excellent research).	3
Quality dimension (Research and publication quality/Research group's contribution)	4/4
Societal impact dimension (Research group’s societal contribution/User involvement)	4/3

Recommendations

- The group is encouraged to further promote the use of systems toxicology, and in silico approaches in their research, education, and recruitment processes to promote cutting-edge toxicology and develop the next generation of toxicologists.
- The group is encouraged to actively promote the use of FAIR principles in their research to facilitate easier sharing of toxicological data among researchers.

- The institute is encouraged to consider opening research professor positions. This would provide institutional recognition to highly successful senior group members and promote high-quality research at the forefront of toxicology.
- There is a heavily skewed gender balance among postdocs and PhD students educated in the research group. The group should consider strategies to promote diversity in recruitment practices to create a more balanced environment.
- To further enhance their societal impact, the group could increase user involvement in their research initiatives and knowledge transfer activities.

1. Strategy, resources and organisation

1.1 Research group's organisation and strategy

The Chemical Toxicology research group is a well-structured research group specialising in chemical hazards and human toxicology. It has established a dynamic research environment driven by a multidisciplinary approach, which has helped it become a national competence centre in its field. The group has a solid track record of attracting external funding from various national and international sources. Their involvement in national and international regulatory frameworks, combined with their advisory roles, ensures that their research informs policy and public understanding. The group has efficiently utilised its resources to advance the understanding of the pathobiology underlying chemical-induced health effects. Their participation in European projects further enhances their impact on both the scientific community and society at large.

The research group (23 staff members, including 6 senior scientists, 4 scientists, 2 senior advisors, 7 head engineers/senior engineers/engineers, a department director, and 6 postdocs/PhDs) is sufficient to meet its objectives in the domain of chemical hazards. The gender balance is quite equal for the staff members but heavily skewed both in postdocs and PhD students. Their team covers a wide range of expertise essential for advising on regulatory matters, engaging actively in national and international regulatory frameworks, and balancing research with advisory roles. With significant involvement in major projects and access to advanced laboratory facilities, the research group is well-equipped to conduct high-level research. Strategically, the group aims for national leadership and recognition within the EU, focusing on key areas like developmental neurotoxicity and immunotoxicology. The group is also moving away from animal experiments and increasing its focus on the development of Adverse Outcome Pathways (AOPs) and the use of New Approach Methodologies (NAMs) and Integrated Approaches for Testing and Assessment (IATA). The group emphasises internationalisation through active participation in European projects and by recruiting specialised expertise. Their benchmarks align with national and EU regulatory frameworks, emphasising scientific publishing and securing competitive projects, and are supported by collaborations and societal engagement. While education is not their primary focus, the group contributes by guest lecturing at universities, hosting master's thesis projects, and facilitating research for PhD students.

Their collaborative efforts are extensive, spanning interdisciplinary, national, international, and non-academic partnerships, which bring in expertise from clinical experts, industry, and government agencies. The institution provides adequate support, covering financial, legal, IT, communication, and library services. Taken together, the organisational environment is adequate for supporting high-quality research in the field of regulatory toxicology and other focus areas relevant to the group's strategic mission.

Recommendations:

- The group has a heavily skewed gender balance among postdocs and PhD students. Strategies to promote diversity in recruitment should be considered to create a more balanced environment.
- The institute is encouraged to open research professor positions to recognise successful senior group members and promote high-quality toxicology research.

1.2 Research group's resources

The Chemical Toxicology research group has demonstrated a strong capability in attracting external research funding, evidenced by a diverse funding portfolio accumulated over the last five years. A stable base funding of about 60 million NOK is complemented by targeted commissioned research funds, significant contributions from the Research Council of Norway (about 14 million NOK) and increasing international funds (20 million NOK) from organisations like the NIH, NSF, and the EU. Their funding from European projects and Nordic regulatory agencies supports studies in human toxicology, with a particular focus on immunotoxicology, developmental neurotoxicity, and the health effects of chemical mixtures. Common research themes include exposure assessments, the mechanisms underlying chemical-induced health effects, and the development of New Approach Methodologies to meet regulatory needs. The group has access to a range of advanced analytical platforms and core facilities: including advanced light microscopy, genomics and proteomics core facilities, and the mass cytometry platform. The department has been a key contributor to the establishment and running of the experimental facility for radiation exposure.

In sum, the Chemical Toxicology research group has a substantial external funding portfolio, sufficient expertise, and access to advanced research platforms, giving it excellent potential for conducting high-quality research.

Recommendations:

- The group is encouraged to further integrate systems toxicology and in silico approaches into their research, education, and recruitment to advance cutting-edge toxicology and train the next generation of toxicologists.

1.3 Relevance to the institution

The Chemical Toxicology research group's dual focus on research and advisory services aligns closely with institutional strategies that prioritise public health safety, regulatory support, and scientific advancement. By integrating research with advisory roles, they ensure that their guidance is based on the latest scientific knowledge. Practically all researchers in the department work 50% on research and 50% on advisory work. The research group serves as a national competence centre for human toxicology, specialising in areas critical to public health such as reproductive toxicity, genotoxicity, and carcinogenicity. Their central position in the field allows them to provide expertise and advisory services on chemical hazards.

2. Research quality

2.1 Research group’s scientific quality

The Chemical Toxicology research group's scientific quality and contributions are excellent. Their research in human toxicology and environmental exposure places them at the forefront of their field. The group stands out due to its multidisciplinary research, involvement in major European projects, and use of innovative methodologies. Their publications in high-impact journals reflect their significant influence in the scientific field. The group has a strong emphasis on translating scientific findings into practical advice for policymakers and the broader public. Their involvement in formulating national chemical risk strategies and nuclear incident preparedness underscores their vital role in public health policy. Through collaborations with national organisations, the Ministry of Health, and international panels like EFSA and WHO, they ensure that their work informs both national and global policy.

The research group demonstrates a high level of scientific quality, as evidenced by their diverse project portfolio, which includes central areas of toxicology research. Integration of advanced in vitro and in silico methodologies positions them at the forefront of toxicological research. Their involvement in significant European projects like HELIX, PARC, and EXIMIOUS demonstrates their strong international collaboration and interdisciplinary work. Projects such as ONTOX and EUROMIX highlight their leadership in pioneering new methodologies for chemical risk assessment. New methodologies and large EU projects generate vast amounts of data, making the utilisation of the FAIR principles increasingly important in data-intensive research, which should be actively considered. The group is also part of the Norwegian Centre of Excellence on Environmental Radioactivity, conducting research to improve radiological risk assessment from environmental radioactivity. All senior PIs have good publication track records, although there is room for improvement. The group's high-impact publications underscore their significant contributions to scientific literature, including substantial contributions to three papers with impact factors (IFs) ranging from 10.7 to 13.3 and participation in The Lancet. Additionally, their involvement in publications with good impact (three publications with IFs between 8.3 and 8.9) and moderate impact (seven publications with IFs between 2.9 and 4.6) reflects their active engagement in their field. Furthermore, the production of research monographs and scientific books solidifies their role in contributing foundational knowledge to the discipline.

Recommendations:

- The group is encouraged to actively promote the use of FAIR principles in their research to facilitate easier sharing of toxicological data among researchers.

2.2 Research group’s societal contribution

The Chemical Toxicology research group's societal contributions have a significant impact, addressing real-life problems and informing both policy and public understanding. Their collaboration with the Norwegian Environment Agency and advisory work on the health effects of chemicals are crucial in translating scientific research into practical applications that benefit public health and safety. Their engagement in knowledge transfer is important for societal development, providing advisory roles to government and responding to public and media inquiries to make scientific knowledge accessible and actionable. Their involvement in formulating national strategies on radon exposure and participating in the preparedness organisation for nuclear incidents highlights their critical role in shaping public health policy and emergency response frameworks. The group's collaborations with non-academic partners, such as the Norwegian Environment Agency, the Norwegian Radiation and Nuclear Safety Authority, and the Ministry of Health, underscore their ability to integrate scientific research into governmental decision-making processes. Additionally, their involvement in international panels like EFSA and WHO demonstrates their global engagement.

Recommendation:

- To further enhance their societal impact, the group could increase user involvement in their research initiatives and knowledge transfer activities.

Appendices

The Research Council of Norway

Evaluation of Life Sciences in Norway 2022-2024

Evaluation of Medicine and Health 2023-2024

Mandate Expert panels

The Research Council of Norway (RCN) is given the task by the Ministry of Education and Research to perform subject-specific evaluations. The Portfolio board for Life Sciences in the Research Council of Norway has decided to carry out an evaluation of medicine and health in 2023-2024 as the second of two evaluations within Life Sciences. The evaluation of biosciences takes place in 2022-2023.

1. The objective of the evaluation

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), by the institute sector and by health trusts.

The results of the evaluation will be used as recommendations to the institutions, the Research Council, and the ministries.

2. Tasks of the expert panels

The panels are requested to:

- evaluate the strategy, resources and organisation of/for the research groups.
- evaluate research production and quality of the research groups.
- grade and write a short evaluation text to the evaluated research groups.

Each of the expert panels will write a brief report with evaluations of the different research groups as well as specific recommendations.

3. Time schedule

Digital panel meetings will take place in the period March 15. - June 15. 2024.
Deadline for submitting panel report to the Research Council: June 15. 2024.

4. Miscellaneous

Other important aspects of Norwegian life sciences research that ought to be given consideration.

EVALMEDHELSE 2023-2024 – Panel group description – January 2024

Panel group	Description	Panel no.
Group 1 PHYSIOLOGY Physiology-related disciplines (human physiology), including corresponding translational research	Anatomy, physiology, embryology, nutritional physiology, pathology, basic odontological research, exercise physiology, neurobiology, toxicology, pharmacology, medicinal chemistry, chemistry, biology, pathology.	Panel 1a Panel 1b
Group 2 MOLECULAR BIOLOGY Molecular Biology, including corresponding translational research	Microbiology, bacteriology, inflammation and infection disease research, forensic medicine, genetics, immunology, vaccine development, microbiological diagnostics, pharmaceutical microbiology, cell biology, molecular medicine and -biophysics, medical biochemistry, omics, organoids, imaging, toxicology, pathology, drug development, cancer research, translational research, systems biology, personalized medicine, biomarkers, oncology, genetics, genomics, epigenetics, proteomics, bioinformatics-/statistics, computational science, AI, biology, virology, radiology, ionisation, molecular biology, microbiology, pharmacology, pharmacogenomics, regenerative medicine and related subjects.	Panel 2a Panel 2b Panel 2c
Group 3a CLINICAL RESEARCH	Clinical Research, including surgery and translational research within: paediatrics, women's health, gynaecology, otorhinolaryngology, head and neck surgery, oncology, haematology, radiology and medical imaging.	Panel 3a_1 Panel 3b_2
Group 3b CLINICAL RESEARCH	Clinical Research, including surgery and translational research within: general medicine, emergency medicine, anaesthesiology, neurology, geriatric medicine, rehabilitation medicine, cardiology, nephrology/urology, endocrinology, pulmonary medicine, orthopaedics, rheumatology, Infection, gastroenterology.	Panel 3b_1 Panel 3b_2 Panel 3b_3
Group 4 PUBLIC HEALTH Public Health and Health-related Research	Public health, community research, epidemiology, preventive medicine, mental health, behavioural research and ethics, medical statistics, environment, nutrition, preventive medicine, physiotherapy, sports medicine, implementation research, public health, health care services research, global health, nursing	Panel 4a Panel 4b Panel 4c

	sciences, rehabilitation sciences, public health systems, digital health care services, ICT, HTA, health competence, genetic and epigenetic epidemiology, non-communicable diseases, pharmacology, nursing research, professional research, occupational medicine.	Panel 4d Panel 4e Panel 4f
Group 5 PSYCHOLOGY Psychology and Psychiatry	Clinical psychology, personality psychology, developmental psychology, cognitive psychology, biological psychology and forensic psychology, psychiatry, including geriatric psychiatry, child and adolescent psychiatry and biological psychiatry, social-, community- and workplace psychology, organizational psychology, developmental psychology, behavioural and health psychology, health promotion and well-being.	Panel 5a Panel 5b

Panel group 1 PHYSIOLOGY

Expert panel 1a

Name	Title	Institution
Ylva Hellsten (chair)	Professor	University of Copenhagen
Georgina Ellison-Hughes	Professor	Kings college
Harri Alenius	Professor	Kings college
Nick Silikas	Professor	Manchester University

Evaluation of Medicine and Health (EVALMEDHELSE) 2023-2024

Self-assessment for research groups

Date of dispatch: **15. September 2023**
Deadline for submission: **31. January 2024**

Updated: **13. October 2023**

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

Content

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), the institute sector and the health trusts. 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 responsible and 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 a research group. The self-assessment contains questions regarding the group's research- and innovation related activities and developments over the years 2012-2022. All submitted data will be evaluated by expert panels.

Deadline for submitting the self- assessment to your administrative unit – 26 January 2024
The administrative unit will submit the research groups' completed self-assessments and the administrative unit's own completed self-assessment to the Research Council within 31 January 2024. Please submit completed self- assessment to the administrative unit no later than 26 January 2024.

Please use the following format when naming your document: [short name of the institution]_[short name of the administrative unit]_[short name of the research group], e.g. *UiT_DepPsy_Short name of the research group*.

For questions concerning the self-assessment or EVALMEDHELSE in general, please contact RCN at evalmedhelse@forskningsradet.no.

Thank you!

Guidelines for completing the self-assessment

- Please read the entire self-assessment document before answering.
- The evaluation language is English.
- Please link to websites/documents in the self-assessment where relevant.
- Please be sure that all documents linked to in the self- assessment are written in English and are accessible.
- The page format must be A4 with 2 cm margins, single spacing and Calibri and 11-point font.
- The self-assessment follows the same structure as the evaluation protocol. In order to be evaluated on the two evaluation criteria described in the evaluation protocol, the research group must answer all questions.
    - ⇨ Provide information – provide documents and other relevant data or figures about the research group, 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 research group and inform the reader about the research group.
    - ⇨ Reflect – comment in a reflective and evaluative manner how the research group operates.
- Data on personnel should refer to data reported to DBH on 1 October 2022 for HEIs and to the yearly reporting for 2022 for the institute sector and the health authorities. Other data should refer to 31 December 2022 if not specified otherwise.
- It is possible to extend the textboxes when filling in the form. **NB!** A completed self- assessment form cannot exceed 25 pages (pdf file). Expert panels are not requested to read more than the maximum of 25 pages. Pages exceeding maximum limit of 25 pages **might not** be evaluated.
- Submit the self- assessment as a pdf (max 25 pages) to the administrative unit within **26 January 2024**. Before submission, please be sure that all text are readable after the conversion of the document to pdf. The self- assessment should be sent from the administrative unit to evalmedhelse@forskningsradet.no within **31 January 2024.**

Please note that information your write in the self assessment and the links to documents/websites in the self-assessment are the only available information for the expert panel.

In exceptional cases, documents/publications that are not openly available must be submitted as attachment(s) to the self- assessment (pdf file(s)).

1. Organisation and strategy

1.1 Research group´s organisation

Describe the establishment and the development of the research group, including its leadership (e.g. centralised or distributed etc.), researcher roles (e.g. technical staff, PhD, post docs, junior positions, senior positions or other researcher positions), the group's role in researcher training, mobility and how research is organised (e.g. core funding organisation versus project based organisation etc.).

Table 1. List of number of personnel by categories
Instructions: Please provide number of your personnel by categories.
For institutions in the higher education sector, please use the categories used in DBH, https://dbh.hkdir.no/datainnhold/kodeverk/stillingskoder. Please add new lines or delete lines which are not in use.

	Position by category	**No. of researcher per category**	**Share of women per category (%)**	**No. of researchers who are part of multiple (other) research groups at the admin unit**	**No. of temporary positions**
No. of Personnel by position	Position A (Fill in)				
	Position B (Fill in)				
	Position C (Fill in)				
	Position D (Fill in)				

1.2 Research group´s strategy

a) Describe the research group's main goals, objectives and strategies to obtain these (e.g. funding, plans for recruitment, internationalization etc.) within the period 2012-2022.

b) Please describe the benchmark of the research group. The benchmark for the research group should be written by the administrative unit in collaboration with the research group. The benchmark can be a reference to an academic level of performance (national or international) or to the group's contributions to other institutional or sectoral purposes.

Example: A benchmark for a research group is related to the research groups' aim which again is included in the strategy for the administrative unit. A guidance for the administrative unit to set a benchmark for the research group(s) can e.g. be: What do the administrative unit expect from the research group(s)?

c) Describe the research group`s contribution to education (master´s degree and/or PhD).

d) Describe the support the host institution provides to the research group (i.e., research infrastructure, access to databases, administrative support etc.).

1.3 Relevance to the institutions

Describe the role of the research group within the administrative unit. Consider the research group's contribution towards the institutional strategies and objectives, and relate the research group`s benchmark to these.

1.4 Research group´s resources

Describe the funding portfolio of the research group for the last five years (2018-2022).

Table 2. Describe the sources of R&D funding for the research group in the period 2018-2022.

	2018 (NOK)	2019 (NOK)	2020 (NOK)	2021 (NOK)	2022 (NOK)
Basic funding					
Funding from industry and other private sector sources					
Commissioned research for public sector					
Research Council of Norway					
Grant funding from other national sources					
International funding e.g. NIH, NSF, EU framework programmes					
Other					

1.5 Research group´s infrastructures

Research infrastructures are facilities that provide resources and services for the research communities to conduct research and foster innovation in their fields. These include major equipment or sets of instruments, knowledge-related facilities such as collections, archives or scientific data infrastructures, computing systems communication networks. Include both internal and external infrastructures.

a) Describe which national infrastructures the research group manages or co-manages.

b) Describe the most important research infrastructures used by the research group**.**

1.6 Research group´s cooperations

Table 3. Reflect on the current interactions of the research group with other disciplines, non-academic stakeholders and the potential importance of these for the research (e.g. informing research questions, access to competence, data and infrastructure, broadening the perspectives, short/long-term relations).

Interdisciplinary (within and beyond the group)	About 1/3 page
Collaboration with other research sectors e.g. higher education, research institutes, health trusts and industry.	About 1/3 page
Transdisciplinary (including non academic stakeholders) *Transdisciplinary research involves the integration of knowledge from different science disciplines and (non-academic) stakeholder communities with the aim to help address complex societal challenges.*	About 1/3 page

2. Research quality

2.1 Research group's scientific quality

Describe the research profile of the research group and the activities that contribute to the research group´s scientific quality. Consider how the research group's work contributes to the wider research within the research group's field nationally and internationally.

Please add a link to the research group`s website:

Table 4. List of projects

Instructions: Please select 5-10 projects you consider to be representative/the best of the work in the period 1 January 2012 – 31 December 2022. The list may include projects lead by other institutions nationally or internationally. Please delete tables that are not used.

Project 1 -10: *Project title/Project period (year from – year to)*	**Project owner(s)** (project leaders organisation)	
	Total budget and share allocated to research group	
	Objectives and outcomes (planned or actual) **and link to website**	

Table 5. Research group's contribution to publications

Instructions: Please select 5-15 publications from the last 5 years (2018-2022) with emphasis on recent publications where group members have a significant role. **If the publication is not openly available, it should be submitted as a pdf file attached to the self-assessment.** We invite you to refer to the Contributor Roles Taxonomy in your description: https://credit.niso.org/.

Cf. Table 1. List of personell by categories: Research groups up to 15 group members: 5 publications. Research groups up to 30 group members: 10 publications. Research groups above 30 group members: 15 publications.

Please delete tables that are not used.

Publication 1 -15: *Project title/Journal/Year/DOI/URL*	**Authors** (Please highlight group members)	
	Short description	
	Research group's contribution	

Table 6. Please add a list with the research group´s monographs/scientific books.
Please delete lines which are not used.

1	Title - Authors (Please highlight group members)- link to webpage (if possible)
2	

2.2 Research group´s societal contribution

Describe the societal impact of the research group's research. Consider contribution to education, economic, societal and cultural development in Norway and internationally.

Table 7. The research group's societal contribution, including user-oriented publications, products (including patents, software or process innovations
Instructions: Please select 5–10 of your most important user-oriented publications or other products from the last 5–10 years with emphasis on recent publications/products. For each item, please use the following formatting. Please delete lines which are not used.

3. Challenges and opportunities

Information about the strengths and weaknesses of the research group is obtained through the questions above. In this chapter, please reflect on what might be the challenges and opportunities for developing and strengthening the research and the position of the research group.

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.

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