

Research Strategy

2019 - 2023

Department of Pharmacology

Division of Laboratory Medicine
Oslo University Hospital/University of Oslo



UiO • **Institutt for klinisk medisin**
Det medisinske fakultet

Vision and overarching goal

In line with the vision of Department of Pharmacology - *Pharmacologic competence in the best interest of patients and society* – the overarching goal of the research activities is as follows:

Research at the Department of Pharmacology should through new knowledge ensure efficient, precise and safe use of drugs, innovative drug development, reliable substance abuse- and doping agent detection as well as research-based teaching.

Research at the Department of Pharmacology

In 2010, the department was established to gather pharmacological competence at Oslo University Hospital (OUS) and at the Faculty of Medicine, University of Oslo (UiO). The department brings together research groups and academic environments located at both OUS and UiO, who are responsible for various research tasks, teaching and patient-oriented routine services. The department carries out research covering the entire drug development process, ranging from basic to clinical research. It is a good starting point for excellent teaching and well-documented patient treatment at the research front.

The purpose of the department's research is to generate new knowledge that, in the short- or long-term perspective, secures better drug treatment. The research should lay the foundation for new treatment principles aiming at drug development and better clinical use of existing drugs.

Maintaining and developing an active research environment is a prerequisite to provide research-based teaching to students and to educate new scientists and teachers with research expertise. An active pharmacological research environment is also a prerequisite to our ability to provide pharmacological services and expertise at a high professional level to patients and our requisitioners.

Research groups/research group leaders within the department:

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| • Pharmacotherapy – comparative effectiveness and new targets | Marianne Klemp |
| • Personalized pharmacotherapy | Stein Bergan |
| • The fight against doping | Yvette Dehnes |
| • Receptors, signaling and cardiac pharmacology | Finn Olav Levy |
| • Neuropharmacology – Alzheimer's disease | Lars Nilsson |
| • Therapeutic drug monitoring | Mimi Stokke Opdal |
| • Clinical research group | Hasse K Zaré |
| • Adaptive Immunity and homeostasis | Jan Terje Andersen |
| • Innate lymphocyte group | Marit Inngjerdingen |

In addition to self-initiated research, the department also provides analytical and pharmacological research support as a partner in projects led by others, or on behalf of external project owners.

The departmental research activities centers around three main research areas:

- **Identification of new pharmacological targets and drug development**
 - Receptors, signaling and cardiac pharmacology
 - Neuropharmacology – Alzheimer’s disease
 - Innate lymphocyte biology
 - Adaptive immunity and homeostasis
 - Pharmacotherapy – comparative effects and new targets
 - Early phase clinical trials

- **Personalized medicine**
 - Personalized pharmacotherapy
 - Pharmacotherapy – comparative effectiveness and new targets
 - Therapeutic drug monitoring

- **Analytical research and toxicology**
 - Analytical anti-doping research
 - Analyses of substance abuse agents
 - Analyses of therapeutics
 - Analyses of toxic agents

Opportunities

The Department of Pharmacology is located close to clinical activities with access to material and clinical data from large and important patient groups. Arriving blood tests and urine samples should be able to be stored in biobanks and linked to registers with clinical information. Clinical samples can thereby serve as a foundation for research on drug use, pharmacogenomics, side effects, substance abuse and drug toxicity. Basic as well as clinical pharmacological research is done within the department enabling good possibilities to build bridges between research disciplines aiming to improve therapeutic principles.

Challenges

The Department of Pharmacology is a relatively small unit within OUS/UiO, and a major challenge is therefore to establish and develop strong research environments. With OUS and UiO having different assignments and tasks, the department's research activities are rather diverse. Adaptive abilities to new collaborative constellations will be important factors in strengthening the pharmacological research environment in years to come.

OUS/UiO expect that local research environments attract external funding to an increasing extent. Considering fierce competition for external funding, strategic planning, facilitation and prioritization will be crucial elements for the department to succeed.

Main strategic goals in 2019 – 2023

1. Generate new knowledge for better therapeutic treatment in the short- and long-term perspective. This includes basic-, translational-, clinical and register-based research

We wish to

- Strengthen basic research, as a foundation for new treatment principles and drug development, especially within cardiovascular diseases, neurological diseases and cancer.
- Increase our activity in translational research.
- Encourage increased research in clinical pharmacology by using therapeutic drug monitoring, pharmacogenomics and pharmacometrics to optimize and personalize drug treatment for different patient groups, particularly of patients being transplanted, having cancer, cardiovascular disease, epilepsy or infection.
- Establish a core facility for personalized drug treatment (therapeutic drug monitoring, pharmacogenomics and establishment of biobanks).
- Increase research activities on biological drugs used for various diseases.
- Strengthen and develop Klinisk forskningspost¹ as an important resource for early phase clinical trials.
- Generate new knowledge on drug efficacy, safety and use by side-effect monitoring, network-based meta-analyses of clinical documentation and register-based research.

2. Research activities at a high international level

Our goals are to

- Publish in well-respected, international journals.
- Create extensive national and international research collaborations.
- Be visible in international research forums.
- Attract international research funding.
- Search for international recruitment at selected position.

3. Support research-based teaching

Our goals are to

- Provide research-based teaching to medical students by research-competent teachers.
- Educate a new generation with dual competence of research and teaching.

¹ «Klinisk forskningspost» is a clinical trial unit, primarily for early phase clinical trials

Plans for implementation

In order to reach our main goals we have identified a number of general measures supporting the main objectives. The general measures relate to resources, cooperation (national and international), visibility and recruitment. In addition, we have identified specific measures related to some of the main objectives (prioritized areas).

General measures

Available resources

In order to strengthen research qualitatively and quantitatively, we need to improve the general conditions for research. This relates to need for increased research resources, long-term research funding and optimal utilization of available resources in terms of equipment, staff, facilities and financing.

Increased external funding

- Prepare more highly competitive grant applications
 - Stimulate identification of projects/topics of high scientific quality that are of importance to society.
 - Credit authorship in a manner that helps young researchers' career development as well as merits established researchers.
 - Increase employees' ability to apply for research funding at UiO as well as OUS.
 - Apply for grant funding nationally (e.g. Helse Sør-Øst, Norway's Research Council) as well as internationally (e.g. EU, ERC).
 - Apply for grant funding from non-profit organizations (e.g. Nasjonalforeningen, Kreftforeningen, NKS, Diabetesforbundet, Civitan, Extrastiftelsen, Thon-stiftelsen).
 - Stimulate research groups to become part of large research centres like SFF, SFI, KG Jebsen Center.
- Apply for funding of fellows, post-docs, researchers, technical assistance, operating costs and equipment.
- Increase the department's participation in collaborative projects and ensure that the department is credited in such projects.

Prioritize internal research resources

- Earmark resources for research expenditures and/or research positions.

Allocate personal for research activities

- Use grant funding to facilitate personal having time for research within working hours, e.g. method development, analytic experiments and blood sampling in research projects.
- Allocate personal/competence between units within the department when useful.

Efficient use of equipment and research facilities

- Maintain updated overviews of research and analytical equipment within the department.
- Aid in efficient use of equipment and facilities across sections and locations within the department.

Collaboration

The research groups in the department vary in size and composition. All groups are interdisciplinary and composed of members from different departments/clinics at OUS/UiO. The research groups are all involved in international cooperation.

International collaboration

We will stimulate increased international collaboration through international recruitment, active participation in international forums, publishing in international journals and network building.

- International calls are to be considered when recruiting personnel.
- We will stimulate the department's researchers, and especially young researchers, to gain new expertise at good foreign educational institutions.
- We will stimulate collaborative research with good international research and education environments.
- We will actively participate in relevant international conferences.
- We will consider applying to host an international pharmacology congress in Norway.

National collaboration

We want to strengthen cooperation with other national academic communities, inside and outside of UiO/OUS. We will encourage increased collaboration with clinical departments.

Collaboration within the organization

We want to facilitate increased and seamless cooperation between the department's UiO and OUS employees, including maintaining and preferably increasing the number of shared positions/grants.

Visibility

We will:

- Identify a few topics on which to focus and become recognized for by producing high-quality research.
- Participate in relevant national and international arenas.
- Improve dissemination of our research.

Recruitment and staffing

- When recruiting new employees, we will assess desired competences in relation to needs.
- Scholarship positions, research positions and academic positions are to be announced internationally.
- We will actively recruit medical research students planning to attend the MD-PhD program.
- We will contribute to career guidance for younger employees.

Prioritized areas

Core facility for personalized medicine (drug analyses, pharmacogenomics and biobanking)

Clinical pharmacological analyses and pharmacological expertise are essential in many research projects. We aim to establish a core facility for personalized pharmacotherapy to increase the overall research activities in this field. This requires infrastructure investments in equipment for advanced drug and pharmacogenomics analyses, including installation of modern analytical instruments and software tools with associated specialized expertise.

Klinisk forskningspost (facility for early phase clinical trials)

We will strive to ensure that Klinisk forskningspost:

- Is provided with functionality, competence and capacity according to the hospital's needs, such that OUS becomes a preferred partner when initiating early phase clinical trials.
- Obtains better and more predictable basic financial conditions.
- Meets national and international requirements of an early phase clinical trial unit.

Innovation

We will seek to identify needs and develop innovative solutions contributing to improved or simplified pharmacological practice. The department will facilitate employee creativity and support implementation of innovative activities. Innovation can include the development of new principles, products, processes or services. We will focus on the following topics:

- Patient-controlled sampling (sampling at home) and digital interaction between patients and the health care system. This constitutes a concept for improved quality and efficiency when monitoring drug treatment.
- Development and implementation of digital tools simplifying data analysis, and interpretation and communication relating to personalized therapeutics. Examples are interpretation and counseling in relation to pharmacogenetics, as well as pharmacokinetic modeling (pharmacometrics)
- Cardiovascular pharmacology
- Neuropharmacology /Alzheimer's disease
- Pharmacological modulation of immune cells for the treatment of e.g. cancer
- New technologies in tailor-made pharmacotherapy
- Biologicals

Advisory Board

We will consider establishing a "Scientific Advisory Board" (SAB) by making a mandate for such a SAB. If found appropriate, we will create a SAB with representatives from relevant pharmacological research environments.