Faculty of Mathematics and Natural Sciences

Profile report: Precision Drug Therapy (Precisie Farmacotherapie)

- Discipline: Precision Medicine, Pharmaceutical therapy, Genetics, Pharmaco-epidemiology, Pharmaco-economics
- Level: Assistant professor (tenure track)
- Fte: Full time (1,0)

1. Scientific discipline

Precision Drug Therapy entails the customization of pharmaceutical therapy with (innovative) diagnostic/genetic tests and pharmaceuticals as well as clinical decision making and practices being tailored to the individual needs of a patient. The core of the discipline is to classify individuals into subgroups that differ in drug effects according to their disease susceptibility, in the pathological molecular mechanism and/or disease prognosis (also referred to as the broader discipline Precision Medicine). The ultimate aim of the discipline is to target preventive or therapeutic drug interventions to those who will benefit most, reducing ineffectiveness and serious and costly adverse effects for those who will not.

2. Vacancy

This position is opened by the Board of the Faculty (EMK/gl/16/00282) and will be embedded in the institute Groningen Research Institute of Pharmacy (GRIP), basic unit PharmacoTherapy, -Epidemiology & -Economics (PTEE). The position falls within the framework of 'Career Paths in Science 3' ('Bèta's in Banen 3'). Please see link for criteria and conditions.

3. Selection committee (BAC)

Prof dr. W.J. Quax, director GRIP, chair
Prof dr. M. Schmidt, deputy programme director. Pharmacy education
Prof dr. B. Wilffert, chair unit PharmacoTherapy, -Epidemiology & -Economics
Prof dr. E. Hak, professor of Clinical Pharmacoepidemiology
Prof dr. M.J. Postma, Director of SHARE and professor of Pharmacoeconomics
External member: Prof dr. A.A. de Boer , Pharmacy UU
Student-member: ……..
Advisors: H. Haagsma (HR advisor)
Prof dr. R.P.H. Bischoff, professor of Analytical Chemistry
Prof. dr. R.H. Sijmons, Medical Translational Genetics (UMCG)

4. Research area

The discipline of Precision Drug Therapy concerns a fast growing area with various scientific challenges and opportunities for top research related to the healthy ageing research agenda. Examples are scientific investigations into the epidemiological risk

stratification according to causal drug effect groups and molecular profile testing, incorporation of research genetic testing into a primary care setting to assess the clinical utility of diagnostic molecular and, genetic testing for the prognosis of various drug-treated chronic (inflammatory) diseases as diabetes, asthma/COPD, cardiovascular diseases, depression among adults and seniors as well as ADHD and atopic diseases among children.
Great prospects are also foreseen in the coming years in the further development of scientific investigations into improved molecular and clinical diagnostic testing for the prevention of drug interactions and serious adverse events associated with drugs as part of the Precision Medicine initiative.
The novel life-cycle approach in drug research integrating knowledge acquired over the various study phases ranging from drug design and preclinical studies, pre-marketing randomized trials to post-marketing pharmacoepidemiological and pharmacoeconomical studies (bench to bedside and vice versa) to arrive at optimal drug development and evaluation programmes in clinical practice comes with potential for multidisciplinary top research.

5. Embedding: institute (and base unit)

The GRIP in Groningen is positioned within the FMNS and physically located within the University Medical Centre Groningen (UMCG) of the Faculty of Medical Sciences (FMS); hence, in an ideal position to benefit from co-operations between both faculties. Together with Medical Sciences, GRIP participates within the Research Institutes GUIDE (Groningen University Institute for Drug Exploration) and (Science in Healthy Aging & healthcaRE), with this vacancy foreseen in participation in both.
Pharmaceutical research at the GRIP is multidisciplinary. It bridges clinical and biomedical sciences on the one side and chemistry, mathematics (statistics) and physics on the other side. The interaction between the pharmaceutical sciences with these fundamental and clinical sciences offers excellent opportunities for cutting-edge research.

GRIP consists of the following research groups (with their chairpersons):
- Analytical Biochemistry (Prof dr. R.P.H. Bischoff)
- Drug Design (Prof dr. A. Dömling)
- Molecular Pharmacology (Prof dr. H. Meurs)
- Pharmaceutical Analysis (Prof dr. E.M.J. Verpoorte)
- Chemical and Pharmaceutical Biology (Prof dr. W.J. Quax)
- Pharmaceutical Technology & Biopharmacy (Prof dr. H.W. Frijlink)
- Pharmacokinetics, Toxicology and Targeting (Prof dr. G.M.M. Groothuis)
- PharmacoTherapy, -Epidemiology & -Economics (Prof dr. B. Wilffert)

With this vacancy GRIPs ambition is to further build on the scientific knowledge generated by the preclinical research groups (e.g. Molecular Pharmacology, Drug Design, Analytical Biochemistry) coordinated by a new center of Precision Drug Therapy which will be based on this life-cycle approach, and to expand the conduct of drug trials and

biomarker discovery and validation with pharmacy networks to gain insights into the impact of drugs in vulnerable patient groups in real-life settings.

The candidate will be embedded in the GRIP research group PharmacoTherapy, -Epidemiology & -Economics (PTEE). PTEE also participates in SHARE were the unit PTEE cooperates within the programme of Methods of Medicines evaluation & Outcomes research and the departments of Epidemiology, Clinical Pharmacy and Pharmacology from the UMCG.
Tools employed in Precision Drug Therapy include pharmacological, genetic, and biomarker diagnostic tests, clinical physical and imaging tests as well as computational methodologies and informatics software. Efficient innovative Precision Drug Therapy however can only be advanced by the application of valid epidemiological studies on large amounts of data and biological samples from various patient populations. To this aim health care Big Data, stored in large locally available databases, as our in-house prescription databases VIPP and IADB.nl, and other databases as Eurocat, GIANTT, LifeLines, Lareb, and RNG are available at the University Groningen.

6. Local and (inter)national position

In The Netherlands, education and research in the area of Precision Drug Therapy is mainly carried out at the UIPS institute, department of Pharmacy of the University Utrecht (UU) and the GRIP institute of the University Groningen. At the UU, research into personalized medicine has a main focus on asthma in children and preventive cardiovascular drug treatment. In Groningen, Precision Drug Therapy is part of the disciplines Pharmacogenetics, Clinical Pharmacoepidemiology, Pharmacoeconomics, Molecular Pharmacology, Analytical Biochemistry and Clinical Pharmacy. The research is embedded in a life-cycle drug approach combining scientific knowledge from bench to bedside and vice versa.
Research collaborations exist with Lifelines, the inter-university Dutch Biomarker Development Center, the Groningen Data Science and Systems Complexity Center, the faculty of Demography, and the Department of Genetics (UMCG). In addition, PTEE has strong (inter)national collaborations with amongst others the Central EUROCAT-network (birth defect registries covering one-third of all births in Europe), the Health Protection Agency (London), and the universities of Ghent and Boston.
Within the context of this vacancy a new Center of Precision Drug Therapy is considered. The tenure track position in Precision Drug Therapy will be instrumental in developing this center and integrating research and education from various angles. An important part concerns the formal establishment of a network of practicing pharmacies and nursing homes for academic research and education. Internationally, only few Western countries (e.g. USA, UK, Canada) have started integrating novel diagnostic tools and clinical prediction rules into actual pharmaceutical practice. The Pharmaceutical Care Network Europe (PCNE) and the European Society of Clinical Pharmacy (ESCP) are large networks enabling the conduct of innovative research, but Precision Drug Therapy is at its infancy.

7. Expected contributions to research

The Tenure Track candidate is expected to extend his/her research programme in the field of Precision Drug Therapy. The research should compete on a worldwide level and lead to publications in top journals. Obtaining substantial external funding for PhD projects is crucial. Supervision of PhD students is an important part of the research activities. The research is expected to strengthen the existing efforts to integrate applied pharmaceutical research within GRIP and SHARE in the programme M2O. Further, the candidate should contribute to the participation and integration of the basic disciplines in his/her research line.

8. Expected contributions to teaching

The candidate is expected to contribute to the teaching programmes within the learning line Precision Medicine (under construction). He/she will be involved in development and/or teaching within the Pharmacy Curriculum with emphasis on Precision Drug Therapy aspects and will contribute to a good quality of the network of community pharmacies to enable high quality internships as well as research internships. He/she will also be actively involved in the development of new courses and/or revision of existing courses. Coaching and supervision of bachelor, master and PhD-students are also an essential part of the teaching tasks.

9. Expected contributions to the organization

The candidate is expected to have an active interest and to provide a positive contribution to the management and organizational tasks of the institute. At the level of the FMNS and GRIP, the candidate will contribute to the organization of the faculty, for example by participating in working groups and committees, in the fields of teaching, research and management. The candidate will participate in relevant national and international organizations.