

CHDR
Centre for Human Drug Research

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Education



Educating the next generation of clinical pharmacologists

At CHDR, educating students and professionals is one of our core values. Our view of education is that it should be innovative, technology-driven, and closely linked to research. Together with our partners — including Leiden University, Leiden University Medical Centre, and others — the goal is to maximise the quality of education by combining state-of-the-art digital technologies with personal interactions between teachers and students.

Education at a glance

- CHDR teaches clinical pharmacology to medical students, students in biomedical sciences, students in bio-pharmaceutical sciences, and other healthcare providers in training (e.g. medical residents, nurse practitioners, and pharmacists-in-training).
- Together with CHDR, Leiden University Medical Centre (LUMC) developed Paul Janssen Futurelab Leiden, a new post-graduate programme for outstanding professionals.
- CHDR also offers post-graduate clinical pharmacology training, with 21 graduates in the past 10 years.
- CHDR has hosted more than 30 PhD students during their thesis studies.
- CHDR's newly developed Clinical Research Programme provides ambitious young researchers and physicians with a well-defined career development path.
- TRC®, CHDR's clinical pharmacology app, has been downloaded more than 150,000 times.
- Thanks to recent upgrades, the TRC app is now compatible with reference drug formularies in the United States, the United Kingdom, and the Netherlands.
- In 2016, CHDR invested heavily in education by developing new courses, with the goal of radically changing pharmacology education by 2020.



Education at CHDR: a closer look

A highly rewarding responsibility

Educating students and young professionals can be extremely rewarding, as it can provide a source of inspiration to students and teachers alike. Educating tomorrow's physicians is also important from an ethics point of view: although medicines can save lives, simple mistakes in pharmacotherapy are a major cause of preventable complications, including patient mortality. Similarly, educating pharmacologists and pharmacists is important in order to ensure continued progress in the fields of medicine and pharmacotherapy.

At CHDR, our staff members are always looking for ways to improve their educational 'duties', and we invite our interns to actively participate in our research. Importantly, being in close contact with students also allows our staff to identify talented students who may be interested in joining the CHDR family.

TRC: CHDR's contribution to global e-learning in the field of pharmacology

One of CHDR's most significant contributions to the education of pharmacology students is our free mobile app, TRC (Teaching Resource Centre), which provides users with instant access to a user-friendly, comprehensive pharmacology e-database built on years of experience teaching pharmacology to medical students. Since it was introduced, the TRC app has been downloaded more than 150,000 times by students around the world. Moreover, the recently upgraded version is fully compatible with reference drug formularies in the Netherlands, the United Kingdom, and the United States (e.g. Micromedex®).

Because the TRC app is web-based, it can be updated continuously to include the newest drugs on the market. In coming years, the app may need to be thoroughly revised in order to accommodate changes in both education and pharmacotherapy.



Innovation plays an essential role in education

In the Netherlands — and indeed in many countries — education is changing rapidly, and the education of healthcare professionals needs to change as well. In the near future, many of the promises related to precision medicine (‘personalised medicine’) will be met. For example, therapies will be matched to individual patients using precise knowledge regarding each patient’s pathophysiological parameters. Costs associated with healthcare will also become increasingly important. On one hand, personalised medicine can be extremely expensive. On the other hand, precision medicine provides higher efficiency and efficacy, greatly decreasing adverse effects. Moreover, modern medicine increasingly uses combinations of medicines, medical devices, surgical interventions, and dietary and lifestyle changes. The use of e-health applications for diagnosing and optimising treatment adds yet another level of complication. Together, these developments will likely increase the complexity of modern medicine such that an individual healthcare professional will no longer be able to deal with all relevant aspects of the disease. Thus, tomorrow’s physicians will need to work closely with technicians, researchers, pharmacologists, and other professionals.

At the same time, education itself is changing rapidly. Thankfully, we are moving away from the traditional, non-interactive system in which a professor presents nearly the same lecture year after year to a large classroom filled with students. For both the students and the teacher, that time spent together could be used far more effectively. Therefore, new teaching tools using modern multimedia technology have emerged, providing students with better education and better preparing students for the challenges of clinical practice. Although these developments in both clinical practice and education provide a unique opportunity to improve the healthcare system, they require investing in the education of students and post-graduate professionals.



Investing in the 'blended learning' approach

To improve pharmacology education and to face the challenges of the future, CHDR is investing in new approaches to education. Using graphics, animations, state-of-the-art video technology, and a fresh approach to blended learning (i.e. combining digital technologies with personal interactions), CHDR and its partners are radically redefining how doctors are taught. CHDR is working closely with the LUMC, Leiden University, and other international academic partners to build a highly flexible platform. With this goal in mind, the TRC app is being revised to include interactive animations and short 'knowledge' clips. We believe that this approach will bring medical and pharmacological education to a higher level, particularly among international undergraduate and post-graduate education programmes, including programmes in developing countries.

Educating both researchers and healthcare professionals

In addition to teaching students, including medical students, CHDR also plays an active role in training healthcare professionals. For years, CHDR has helped physicians with a special interest in pharmacotherapy and clinical studies to become board-certified clinical pharmacologists. This training programme can be completed in one year full-time, or it can be

completed part-time over several years. In addition to lecture-style courses and practical training (for example, with respect to designing and conducting pharmacology studies in healthy volunteers and patients), the programme also includes clinical work, for example advising doctors regarding the choice, dosage, adverse effects, and possible interactions associated with specific drugs.

Of course, our employees are always encouraged to improve themselves through continuing education, for example through our comprehensive Clinical Research Programme (see Text Box). In addition, PhD students can conduct their thesis research at CHDR.

In close collaboration with Leiden University and the Leiden Bio Science Park, CHDR developed Paul Janssen Futurelab Leiden, a post-graduate training programme for aspiring entrepreneurs and leaders in the life sciences and healthcare fields. This innovative programme is particularly well-suited to young scientists who hope to bring their research results to market. In the programme, participants learn the secrets of business, and they reflect upon their new ethical responsibilities with respect to individuals and society. Real-world cases are introduced and used to discuss the various roles and responsibilities faced by entrepreneurial scientists.



CHDR's Clinical Research Programme

The Clinical Research Programme gives ambitious young researchers and physicians a well-defined career development path. In this rigorous five-year PhD programme, participants design and conduct several research projects while being coached by senior clinical scientists and research directors. Each participant is responsible for developing, leading, and reporting a clinical trial, thereby gaining valuable experience in a specific scientific field. Throughout the programme, participants develop key skills and competences in project management, clinical pharmacology, and scientific research. Participants also collect data for their PhD thesis. In the final year of the programme, the senior project leader discusses the participant's future career plans. Regardless of whether the participant continues his/her career at CHDR or elsewhere, the skills and competences obtained from the programme will help ensure long-term success in research, business, and/or the healthcare sector.



Why choose CHDR?

The Centre for Human Drug Research specialises in early-phase clinical drug research. CHDR's overall mission is to improve the drug development process by collecting as much information as possible regarding the candidate drug in the early phases of development. This information helps sponsors make informed decisions regarding the course of clinical development for their product.

Why choose CHDR?

Research at CHDR covers a wide range of fields, including the central nervous system (CNS) and pain, the cardiovascular system, haemostasis, immunology, and dermatology. In addition, CHDR is at the forefront in developing novel biomarkers and methods for measuring drug-related effects in all of these research areas.

Pharmacology matters

Whether studying a new cognitive-enhancing drug, a next-generation painkiller, or a new monoclonal antibody designed to treat rheumatoid arthritis, the goal is to determine how the compound's effects correlate with both the dose and blood concentration at any given moment. In addition, understanding which biological systems are activated is an essential first step towards quantifying this relationship. At CHDR, our focus on pharmacology is reflected clearly in what we call question-based drug development.

Question-based drug development

CHDR actively uses question-based drug development - or QBD - as a more rational approach to drug development compared to conventional approaches. QBD can be best described as a series of questions that are addressed throughout the process. These questions often seem simple enough, but failing to answer even one question - or even addressing the questions in the wrong order - can have dire consequences. Thus, using this approach can potentially save companies millions of dollars by helping predict a catastrophic issue early in the development process, before the more expensive latter stages (for example, large-scale clinical trials or the marketing phase).


From a general perspective, the most important questions are:

1. Does the biologically active compound and/or active metabolite(s) reach the intended site of action?
2. Does the compound cause its intended pharmacological and/or functional effect(s)?
3. Does the compound cause any unintended pharmacological and/or functional effect(s)?
4. Does the compound have a beneficial effect on the disease and/or clinical pathophysiology?
5. What is the compound's therapeutic window?
6. How does any variability with respect to the drug response in the target population affect the product's development?



Contact

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