



## Division of Clinical Pharmacology

### PhD student position in Pharmacometrics



The Division of Clinical Pharmacology at the University of Cape is looking for bright and highly motivated science graduates who wish to join their research team to pursue a **PhD in the area of pharmacometrics**.

Pharmacometrics is an emerging discipline that uses mathematical and statistical tools to quantify drug, disease, and trial information to aid efficient drug development and/or regulatory decisions. It designs and applies mathematical models to describe the relationship between drug exposure (pharmacokinetics) and response (pharmacodynamics) for both desired and undesired effects, and aims to include in such models the effects of individual patient characteristics.

Our Pharmacometrics Group has established **pharmacokinetic/pharmacodynamic modelling** expertise in **tuberculosis, HIV, and malaria**. It is active internationally and enjoys on-going collaborations and exchange programs with some of the most renowned pharmacometric modelling groups worldwide.

This PhD position is not only a great chance to learn a unique and highly-sought set of professional skills geared towards a career either in academia or in the pharmaceutical industry, but also a rewarding opportunity for a student in quantitative sciences to apply their expertise within the fascinating framework of biomedical research.

#### Conditions of Award

- Eligible candidates must hold a **Master's degree (or equivalent)** in **pharmacometrics, applied mathematics, engineering, (bio-)statistics, pharmacy/pharmaceutical sciences**, or a closely related discipline
- The fellowship involves advanced mathematical/statistical/computer modelling and simulation. **Strong quantitative skills are required, and preferably** experience with **computer programming** (e.g. R, Python, Matlab, C++) and **data analysis**.
- Previous experience in pharmacometrics and pharmacology would be advantageous, but not essential. Candidates without prior direct experience will have to show evidence of the ability to quickly get familiar with new analysis tools and techniques.
- The PhD student will be required to contribute to the research activity of the pharmacometric group:
  - The PhD projects will be linked with the clinical research interests of the division, i.e. predominantly the therapeutic areas of HIV, tuberculosis, and malaria, with a focus on drug-drug interactions and dose optimization for neglected populations, such as paediatrics and pregnant women.
  - Candidates interested in pursuing more methodological topics (but relevant to the clinical interests of the division) will be encouraged to do so.
- A good command of English, passion about scientific research, and the ability to work within a team are essential.

#### Scholarship offered

The successful candidate will be registered for a PhD at the University of Cape Town, and a tax-free scholarship covering tuition fees and supporting living expenses in Cape Town will be arranged. This financial support is available for up to 4 years, but yearly renewal is conditioned on satisfactory academic progress.

## Application Requirements

The candidates are required to submit the following:

- A letter of interest/introduction (max 1 page) in which the candidate motivates why s/he is suitable for the award of the fellowship;
- A CV including details of conferences presentations and all publications;
- The names and email addresses of at least three academics or employers who have agreed to stand as referees on behalf of the applicant
- Certified copies of academic transcripts (these can be sent later, if the candidate's application is successful)

Please fill in the following form <https://forms.office.com/r/HvViRH92f> All enquiries must be submitted to [pharmacometrics@uct.ac.za](mailto:pharmacometrics@uct.ac.za). Applicants for this call must submit their documentation by April 15<sup>th</sup> 2022, but enquiries regarding further future positions are welcome.

The University of Cape Town reserves the right to make no awards at all, to cancel the award if the conditions are not met, and to effect changes to the conditions of the award. The University of Cape Town reserves the right to disqualify ineligible, incomplete and/or inappropriate applications.



$$\begin{aligned}
 \frac{dA_1(t)}{dt} &= -\frac{CL_{NON}}{V_{CY}} A_1(t) - \frac{CL_{IND}}{V_{CY}} A_1(t) A_2(t) - k(0,1) A_1(t) + ex1 \\
 \frac{dA_2(t)}{dt} &= K_{ENZ} \left( 1 + \frac{E_{MAX}}{E_{50} + \frac{A_1(t)}{V_{CY}}} \right) q_1(t) + k(2,1) q_1(t) + k(1,2) q_2(t) + ex1 \\
 \frac{dA_3(t)}{dt} &= \frac{CL_{IND}}{V_{CY}} A_1(t) A_2(t) - K_{12} q_1(t) - k(1,2) q_2(t) \\
 \frac{dA_4(t)}{dt} &= K_{34} \cdot A_3(t) - K_{CEPM} \cdot A_4(t)
 \end{aligned} \quad (A)$$

