



## PhD/MSc Scholarship in Patient-Specific Simulation of Ventricular Remodelling in Inflammatory Heart Diseases

The Computational Continuum Mechanics Research Group of the University of Cape Town together with the Department of Medicine invite applications from suitable candidates for PhD / MSc Scholarship as part of the collaborative project "Patient-Specific Simulation of Ventricular Remodelling in Inflammatory Heart Diseases".

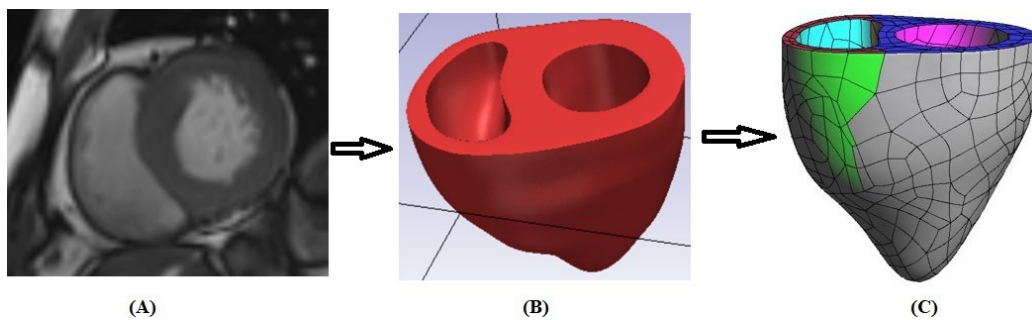


Figure 1: Reconstruction of a patient-specific biventricular heart model from a CMR scan.

This project aims at combining clinical cardiovascular techniques with computational cardiac mechanics to gain insight into the chronology of inflammatory heart diseases from the medical and the biomechanics perspective to guide decision making in finding patient-specific treatment options most suitable to these kinds of pathological conditions of the heart. The core outcome is therefore to identify the processes involved in the conversion of mechanical stimuli into biochemical events that induce maladaptive changes in myocardial structure and function leading to pathological cardiac hypertrophy and remodelling, as well as the transition to heart failure.

Computer simulations of patient-specific heart models will allow for the in-depth cardiac mechanics study of RHD pathology on tissue and organ level. The modelling will be informed by complementary clinical research comprising cardiovascular magnetic resonance (CMR) imaging, echocardiography and cardiac catheterization to characterize alterations to cardiac tissue composition and hemodynamics-linked performance indicators of the heart in RHD and healthy controls. Computational case studies will help evaluating the efficacy of potential treatment strategies.

### Conditions of Award:

#### 1. PhD scholarship:

- Applicants should have a Master's degree in Mathematics, Physics, Engineering, or related disciplines;
- Successful candidates will be required to register for full time study at the Department of Medicine or the Department of Civil Engineering, University of Cape Town;

- Successful candidates will be required to comply with the approved policies, procedures and practises for funding for the postgraduate sector at the University of Cape Town;
- Successful candidates may not hold full-time salaried positions concurrently with these scholarships.

## **2. MSc scholarship:**

- Applicants should have an Honours degree in Mathematics, Physics, Engineering, or related disciplines;
- Successful candidates will be required to register for full time study at the Department of Medicine or the Department of Civil Engineering, University of Cape Town;
- Successful candidates will be required to comply with the approved policies, procedures and practises for funding for the postgraduate sector at the University of Cape Town.
- Successful candidates may not hold full-time salaried positions concurrently with these scholarships.

### **Value and tenure:**

#### **1. PhD scholarship:**

The value of the PhD scholarship is ZAR 180,000 per annum. The successful candidate will be able to claim the award on registration in 2023. The tenure of the award is one year. Renewal for a second and a third year will be considered and will be contingent on satisfactory academic progress.

#### **2. MSc scholarship:**

The value of the Masters scholarship is ZAR 120,000 per annum. The successful candidate will be able to claim the award on registration in 2023. The tenure of the award is one year. Renewal for a second year will be considered and will be contingent on satisfactory academic progress.

### **Application process:**

Suitably qualified candidates are required to submit:

- A CV including any publications or research output;
- Certified copies of academic transcripts (from candidates external to UCT);
- The names and contact details of 2 academics who have taught/supervised the candidate.

Further information can be obtained from, and applications submitted to Prof Sebastian Skatulla (Email: [sebastian.skatulla@uct.ac.za](mailto:sebastian.skatulla@uct.ac.za), Tel +27 21 650 2595) and Prof Ntobeko Ntusi (Email: [ntobeko.ntusi@uct.ac.za](mailto:ntobeko.ntusi@uct.ac.za), Tel +27 21 406 6200).

Applications will be accepted until position is filled.

Only shortlisted candidates will be contacted.

The University of Cape Town reserves the right to cancel incomplete applications,