



## Postdoctoral Fellowship in Mechanotransduction of Ventricular Remodelling in Inflammatory Heart Diseases

The Computational Continuum Mechanics Research Group of the University of Cape Town together with the Department of Human Biology, the Institute of Infectious Disease and Molecular Medicine, and the Cape Universities Body Imaging Centre have an opportunity for a postdoctoral fellowship part of the collaborative project "Patient-Specific Simulation of Ventricular Remodelling in Inflammatory Heart Diseases" funded by the NRF Blue Skies Programme.

This project aims at combining medical imaging techniques, mechanical tissue testing, as well as cell and molecular biological analysis of cardiac tissue samples 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.

Clinical research will comprise of histological and proteomics studies and will be based on biopsies taken from patients having undergone surgery. Bioinformatical analysis of the acquired data will help to formulate mathematical models describing the mechanisms underlying mechanotransduction in cytoskeletal and sarcolemmal structures in cardiac myocytes. These models will be implemented in an existing in-house developed comprehensive computational cardiac mechanics software package to supplement clinical research by means of computational case studies simulating the electrophysiology and biomechanics of the whole heart.

This project is a multidisciplinary collaboration also comprising of external investigators from the Auckland Bioengineering Institute at the University of Auckland (New Zealand), the Department of Civil Engineering at the University of Duisburg-Essen (Germany) and the Institute of Mechanics Statics Dynamics at the University of Dortmund (Germany). Parts of the research work may therefore be conducted by studies abroad.

### Conditions of Award:

- (i) The successful candidate must be in possession of a PhD or equivalent degree in a relevant area (Medicine, Molecular/Human Biology, Mathematics, Physics, Engineering, or related disciplines).
- (ii) Only individuals who have achieved the doctoral degree within the past 5 years are eligible to apply.
- (iii) Applicants may not previously have held full-time professional or academic positions.
- (iv) The successful candidate may, as part of their professional development, be required to participate in departmental activities such as limited teaching and supervision and duties incidental thereto.
- (v) The successful incumbent will be required to comply with the University's approved policies, procedures and practices for the postdoctoral sector.

### Value and tenure:

The value of the fellowship is ZAR 250,000 per annum. No benefits or travel allowances are included in the value of the fellowship. The fellowship is tenable for 1 year with the possibility for renewal for a second year, dependent on performance.

### Application process:

Applicants should provide the following:

- A letter of application describing their academic interests, as stated above in "Conditions of Award" item (i);
- Certified copies of academic transcripts and evidence of having graduated with the PhD degree;
- A CV including any publications or research output;
- The names and contact details of 3 academics/referees.

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

Applications will be accepted until the fellowship has been awarded.

Only shortlisted candidates will be contacted.

The University of Cape Town reserves the right to cancel incomplete applications, to effect changes to the conditions of the Fellowship and/or to make no awards at all.