

## DEPARTMENT OF GENETICS

### ● HUMAN GENETICS

## DR NATHANIEL MCGREGOR

B.SC. (MOLECULAR AND CELLULAR BIOLOGY) B.SC.HONS (GENETICS) M.SC. (CUM LAUDE) PH.D. (PSYCHIATRY) (STELL)

### Biography

Dr McGregor is a Stellenbosch University Alumnus. After completing his B.Sc.Hons. and M.Sc. degrees in the Department of Genetics, he completed his Ph.D. in Psychiatry at Tygerberg Medical Campus where he specialized in Neuropsychiatric Genetics. In 2014 Dr McGregor was awarded the NRF Scarce Skills Post-Doctoral Fellowship and split his research time between the SU/ UCT MRC Unit on Anxiety and Stress Disorders and the Pharmacogenetics Research Group lead by Prof Louise Warnich, Dean of Science. In addition to this Dr McGregor also forms part of the MRC SHARED-ROOTS Flagship Project's research team, led by Prof Soraya Seedat, investigating the mechanisms underlying metabolic syndrome and mental illness. In 2016 Dr McGregor was appointed as Lecturer in the Department of Genetics under the division Human Genetics, although he maintains active roles in the aforementioned research projects listed. At present, Dr McGregor teaches various modules in introductory genetics, pharmacogenomics as well as the Human and Animal genetics component of the Genetics B.Sc. Honours degree. Dr McGregor is a multiple NRF Scarce-Skills Scholarship awardee, and an Erasmus Mundus scholarship recipient enabling collaboration with Stockholm's Center for Molecular Medicine at the Karolinska Institute. He is also a member of the South African Society of Human Genetics, the American Society of Human Genetics and the South African Neuroscience Society.

### Research area

Dr McGregor's research spans a number of disease areas, however they all fall under the focus of neuropsychiatric genetics. That is investigating the underlying molecular genetic mechanisms related to mental health (and associated) disorders.

Considering Pharmacogenomics, Dr McGregor has particular interest in the genetic mechanisms associated with antipsychotic treatment outcome, and the affiliated adverse drug reactions in Schizophrenia patients. Also under the heading of pharmacogenomics, Dr McGregor looks at the molecular mechanisms underlying optimal treatment response in newly infected HIV individuals on first-line anti-retroviral drugs.

Branching into Anxiety and Stress Disorders, Dr McGregor works with clinicians at the SU/ UCT MRC Anxiety and Stress Disorders Unit where he looks into multi-dimensional statistical assessments of genetic variables contributing susceptibility risk to anxiety disorders. Built into these models, Dr McGregor emphasises epigenetic mechanisms (the ability of environmental influences to alter the clinical manifestation of disorders) by considering the severity of childhood trauma in disorder manifestation.

In all research areas Dr McGregor stresses the importance of the unique genetic diversity of the South African and Sub-Saharan African populations and its role in understanding disease mechanisms. In this sense all neuropsychiatric research considers population diversity utilising population genetics tools to allow for 'personalised medicinal' recommendations in research outputs.





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- SASHG – The Next Generation, Pretoria (2015), Poster Presentation: Investigation of Variants within Antipsychotic Candidate Pharmacogenes Associated with Treatment Outcome. F. Higgins, B. Drogemoller, G. Wright, L. van der Merwe, **N. McGregor**, B. Chiliza, L. Asmal, D. Niehaus, R. Emsley, L. Warnich
- XXIII<sup>th</sup> World Congress of Psychiatric Genetics (2015) Toronto, Canada. Poster Presentation: The identification of novel genes in anxiety disorders: a gene x environment correlation and interaction study. **N.W. McGregor**, J. Dimatelis, S.M.J. Hemmings, C.J. Kinnear, D. Stein, V. Russell, C. Lochner
- XXIII<sup>th</sup> World Congress of Psychiatric Genetics (2015) Toronto, Canada. Poster Presentation: Polymorphisms within the neuronal cadherin (*CDH2*) gene are associated with susceptibility risk to develop Obsessive-compulsive Disorder (OCD) in a South African Caucasian cohort, considering a history of childhood trauma. **N.W. McGregor**, C. Lochner, D. Stein, S.M.J. Hemmings