

# Institute of Infectious Disease and Molecular Medicine (IDM)

## Research Report 2015

**Director: Professor Valerie Mizrahi**

### Institute Profile

The IDM is a trans-faculty postgraduate research institute with research focusing on infectious diseases, particularly HIV/AIDS and tuberculosis; non-communicable diseases including prevalent cancers; genetic medicine; and molecular medicine. The Institute is distinguished by research that is carried out at the laboratory-clinic-community interface, and across a wide range of disciplines.

A number of important changes aimed at strengthening the institute's structures for governance and management were implemented in 2015. Prof. Jonathan Blackburn was appointed Deputy Director of the IDM, a new position created to assist the Director with finance, operations and infrastructure. Four members of the IDM's International Scientific Advisory Committee (ISAC) retired, and in their place we welcomed Prof. Alash'le Abimiku, Institute of Human Virology, Nigeria; Prof. Sir Tom L. Blundell, Department of Biochemistry, University of Cambridge; Dr. Andrew Kambugu, University College of Health Sciences, Uganda; Prof. Shabir Madhi, NICD, Johannesburg; and Prof. David Russell, Cornell University College of Veterinary Medicine. After extensive consultation with Members, the guidelines for assessing the continuation of Full membership were revised and updated. Finally, the relationship between the IDM and academic departments from which members are drawn was clarified, and a Performance Agreement for Full and Associate Members was introduced in which the activities for which a Member is accountable to the IDM Director vs. their HOD are set out and reviewed on an annual basis.

Publications produced by Full and Associate Members included 6 book chapters and 299 journal papers including papers in *The Lancet*, *New England*

*Journal of Medicine*, *Nature*, *Nature Biotechnology*, *Nature Medicine* and *The Lancet Infectious Diseases*. In 2015, 10 patent applications were filed and 4 more granted. Prof. Ed Rybicki was awarded the inaugural UCT Deputy Vice-Chancellor's Award for Achievement in Innovation. Significant scientific advances with implications for health policy and practice were also made.

Research income totalled -R427.5 million (26.5% and 61.4% increases on 2014 and 2013 respectively). Dominant funders included the Bill & Melinda Gates Foundation, the US National Institutes of Health, the Aeras Global TB Vaccine Foundation, The Wellcome Trust, and the SAMRC. Personal awards included an A1 NRF rating to Prof. Valerie Mizrahi; Prof. Robert Millar was announced as the next recipient of the prestigious John F. W. Herschel Medal (2016), from the Royal Society of South Africa in recognition of his *Highly Distinguished Multidisciplinary Contributions to the Furtherance of Science*; Prof. Robert Wilkinson won the 2015 SAMRC Gold Medal for Exceptional Achievements by an International Scientist; and Dr. Helen Cox received the prestigious Union Scientific Prize from the International Union Against Tuberculosis and Lung Disease. Professors Stefan Barth and Graeme Meintjes took up their NRF SARCHI Chairs. Prof. Linda-Gail Bekker served the first of two-year term as President-Elect of the International AIDS Society (IAS) and Prof. Nicola Mulder was placed on Thomson Reuters' Highly Cited Researchers List (for 2015) for the second year in a row.

Capacity building remained a priority. Our Mid-Career Fellowship Programme was funded in its final year by the Hasso Plattner Foundation (supporting 3 emerging researchers); and the UCT Carnegie Corporation-funded *Developing the Next Generation of Academics* programme supported 8 PhD students and 4 postdoctoral fellows. Two Master Classes in advanced areas of biomedical research technology, presented by international experts, contributed to staff and student development. New equipment acquisitions totalled >R2 million. The newly established Biomedical Translational Research Initiative, based in the IDM and supported through a partnership between UCT and the CSIR, is expected to have a profound impact on IDM-based research and training programmes by significantly enhancing the light microscopy platform at UCT.

Collaborations continued with researchers based at 24 South African institutions, 42 institutions in 22 other African countries, and 150 institutions in 27 countries further afield. Researchers participated in 63 research consortia, and in co-operative research initiatives with 26 international and 9 national industrial partners. Member groups continued to lead

major outreach programmes in local communities. Amongst other activities, the DTHC trained health care workers across multiple organisations, and the DTHF ran the Masiphumelele Youth Centre with its very successful programmes; the Isisombululo Programme continued to function at the new public/private clinic in George; and CIDRI, DTHC and SATVI clinical staff served the local communities around their clinical research sites.

## Institute Statistics

### Staff

All IDM Members and academic staff in Member groups are appointed in academic departments.

Professors	26
Associate Professors	9
Senior Researchers	8
Research officers & lab, clinical and field site assistants	191
Finance and procurement staff	25
Technical, operational and administrative staff	71
<b>Total</b>	<b>330</b>

### Students and Postdoctoral Fellows

These figures reflect only those based in the IDM Complex and Falmouth building where the majority of IDM Members' research groups are based.

Postdoctoral fellows	87
Doctoral	157
Masters	93
Honours	31
<b>Total</b>	<b>368</b>

## Areas of Interest/Expertise

### Full Members

#### PROFESSOR VALERIE MIZRAHI

IDM Director  
MRC/NHLS/UCT Molecular Mycobacteriology Research Unit & DST/NRF Centre of Excellence for Biomedical TB Research  
Department of Pathology

Mycobacterial physiology & metabolism relevant to TB drug resistance and drug discovery

#### PROFESSOR STEFAN BARTH

SARChI Chair in Cancer Biotechnology  
Department of Integrative Biomedical Systems  
Medical biotechnology, antibody technologies, protein engineering, immunodiagnostics & therapeutics, bioassay development & integration

#### PROFESSOR LINDA-GAIL BEKKER

Desmond Tutu HIV Centre (DTHC)  
Department of Medicine  
Pathogenesis of tuberculosis and HIV infection

#### PROFESSOR JONATHAN BLACKBURN

SARChI Chair in Applied Proteomics & Chemical Biology  
Department of IBMS

#### PROFESSOR FRANK BROMBACHER

SARChI Chair in Immunology of Infectious Diseases in Africa  
MRC/UCT Immunology of Infectious Diseases Unit  
Department of Pathology & ICGEB

#### DR WENDY BURGERS

Department of Pathology  
HIV pathogenesis & vaccine immunology, HIV-TB co-infection

#### PROFESSOR KELLY CHIBALE

SARChI Chair in Drug Discovery  
H3-D Centre for Drug Discovery & Development  
Department of Chemistry

#### PROFESSOR CLIVE GRAY

Department of Pathology  
Immunopathogenesis of HIV, CD4 and CD8 T cells, vaccine-induced immunity

#### PROFESSOR JANET HAPGOOD

Department of Molecular and Cell Biology  
Steroid receptors, glucocorticoid receptor, immune function and HIV-1 pathogenesis

#### ASSOC PROFESSOR MARK HATHERILL

SA Tuberculosis Research Initiative (SATVI)  
Department of Pathology  
Childhood clinical immunology, tuberculosis and mycobacterial infection, novel TB vaccines

#### PROFESSOR GREGORY HUSSEY

Vaccines for Africa  
Department of Pathology (& Interim Dean)  
Vaccinology, clinical trials, tuberculosis, paediatric infectious diseases

**ASSOC PROFESSOR MUAZZAM JACOBS**

Department of Pathology  
Experimental tuberculosis and immunology

**PROFESSOR ARIEH KATZ**

MRC/UCT Receptor Biology Research Unit  
Department of Integrative Biomedical Systems  
G protein-coupled receptors, kisspeptin, cervical cancer, Kaposi sarcoma

**PROFESSOR SUSAN KIDSON**

Department of Human Biology  
Cell and developmental biology, embryonic and skin stem cells

**ASSOC PROFESSOR DARREN MARTIN**

Computational Biology  
Department of Integrative Biomedical Systems  
Bioinformatics, virus evolution, genetic recombination

**PROFESSOR GRAEME MEINTJES**

Clinical Infectious Diseases Research Initiative (CIDRI)  
Department of Medicine  
HIV-associated TB, TB-associated immune reconstitution inflammatory syndrome (TB-IRIS), cryptococcal meningitis

**PROFESSOR ROBERT MILLAR**

MRC/UCT Receptor Biology Research Unit  
Department of Integrative Biomedical Systems  
Peptide regulators of reproductive hormones

**PROFESSOR NICOLA MULDER**

Computational Biology  
Department of Integrative Biomedical Systems  
Bioinformatics of infectious diseases

**PROFESSOR MARK NICOL**

Department of Pathology  
Novel diagnostics for tuberculosis, strain biology of tuberculosis

**ASSOC PROFESSOR JO-ANN PASSMORE**

Department of Pathology  
HIV/HPV mucosal immunology

**PROFESSOR RAJKUMAR RAMESAR**

MRC/UCT Human Genetics Research Unit  
Department of Pathology  
Genetic predisposition to cancer; eye or neuropsychiatric diseases

**PROFESSOR ED RYBICKI**

Department of Molecular and Cell Biology  
Vaccine, viral and plant biotechnology, molecular virology and viromics

**ASSOC PROFESSOR THOMAS SCRIBA**

SA Tuberculosis Research Initiative (SATVI)  
Department of Pathology  
Clinical immunology, tuberculosis and mycobacterial infection, novel TB vaccines

**PROFESSOR TREVOR SEWELL**

Director: Electron Microscope Unit  
Department of Integrative Biomedical Systems  
Large biological structures, inter-molecular interactions, chaperoning nitrilases and chromatin

**PROFESSOR ED STURROCK**

Department of Integrative Biomedical Systems  
Protein biochemistry, protease inhibitor design, ectodomain shedding of angiotensin-converting enzyme

**PROFESSOR JACK VAN HONK**

Dept of Psychiatry and Mental Health (& University of Utrecht)  
Social and Affective Neuroscience (Human Neuroscience), psychobiology of human social-emotional behavior, psychopathologies of fear and aggression

**HON. PROFESSOR ROBERT WILKINSON**

Clinical Infectious Diseases Research Initiative (CIDRI)  
Department of Medicine (& Imperial College London)  
Tuberculosis and the effect of HIV infection

**PROFESSOR ANNA-LISE WILLIAMSON**

SARChI Chair in Vaccinology  
Department of Pathology  
HIV, papillomavirus, poxviruses, vaccine development

**PROFESSOR CAROLYN WILLIAMSON**

Department of Pathology  
HIV diversity and pathogenesis, HIV-1 vaccine development, microbicides

**EMER. PROFESSOR ROBIN WOOD**

Desmond Tutu HIV Centre (DTHC)  
Department of Medicine  
Pathogenesis of tuberculosis and HIV infection

**Associate Members****DR ANNA COUSSENS**

Clinical Infectious Diseases Research Initiative (CIDRI)  
Department of Pathology  
Immunopathogenesis of TB-HIV, biomarkers of infection, host-directed therapies

**DR HELEN COX**

Department of Pathology  
Epidemiology of TB & drug-resistant TB, TB diagnostics & treatment

**PROFESSOR COLLET DANDARA**

Department of Pathology  
Pharmacogenomics, drug metabolism, human genetic variation, genetic susceptibility

**DR RETO GULER**

Department of Pathology & ICGEB  
Immunology, infectious diseases, tuberculosis, listeriosis, leishmaniasis, identification of host-directed drug targets

**ASSOC PROFESSOR WILLIAM HORSNELL**

Department of Pathology  
Immunology of infectious diseases, helminth infections, acetylcholine signalling

**DR HEATHER JASPAN**

Department of Pathology  
HIV/AIDS, paediatrics, vaccines, adolescent and neonatal HIV prevention

**ASSOC PROFESSOR VIRNA LEANER**

Department of Integrative Biomedical Systems  
Transcriptional regulation and cancer biology

**DR SUZAAN MARAIS**

Clinical Infectious Diseases Research Initiative (CIDRI)  
Department of Medicine  
Tuberculous meningitis; neurological TB-associated immune reconstitution inflammatory syndrome; HIV-associated neurological disorders

**ASSOC PROFESSOR CATHERINE ORRELL**

Desmond Tutu HIV Centre (DTHC)  
Department of Medicine  
HIV: adherence, retention and resistance

**DR CATHERINE RIOU**

Department of Pathology  
T cell immunology, HIV/TB co-infection

**DR GEORGIA SCHÄFER**

Department of Integrative Biomedical Systems  
Oncogenic viruses, host-pathogen interactions, cancer biology, transcriptional regulation

**ASSOC PROFESSOR DIGBY WARNER**

MRC/NHLS/UCT Molecular Mycobacteriology Research Unit & DST/NRF Centre of Excellence for Biomedical TB Research  
Department of Pathology  
Mycobacterial physiology, DNA repair and replication in Mycobacterium tuberculosis, drug resistance, role of vitamin B12 in mycobacterial pathogenesis

**ASSOC PROFESSOR KATALIN WILKINSON**

Clinical Infectious Diseases Research Initiative (CIDRI)  
Department of Medicine  
Immunology of HIV associated tuberculosis

**Contact Details**

Postal Address: Institute of Infectious Disease and Molecular Medicine, Faculty of Health Sciences, University of Cape Town, Private Bag X3, Rondebosch 7701, Cape Town  
Telephone: +27 21 406 6063  
Fax: +27 21 650 1601  
Website: <http://www.idm.uct.ac.za>