

Professor Samantha Sampson

Career and Employment History

- 2013-present **Associate Professor, NRF SARChI Chair in Mycobactomics**
DST/NRF Centre of Excellence in Biomedical Tuberculosis Research, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa
Mycobactomics (integrating data-rich methodologies through use of computational approaches)
- 2006-2013 **Wellcome Trust Research Career Development Fellow, Research Associate**
Section of Microbiology/Centre for Molecular Microbiology and Infection
Imperial College London, London, UK
TB host-pathogen interactions
- 2005-2006 **Visiting Scientist**
Harvard School of Public Health, Boston, USA
Development of a novel pulmonary delivery method for TB vaccines
- 2001-2005 **Post-doctoral Research Fellow**
Harvard School of Public Health, Boston, USA
Safety and efficacy studies of a live attenuated auxotrophic TB vaccine candidate
- 1998-1999 **Ph.D. Project student**
GlaxoSmithKline, Stevenage, UK
Cloning, expression and characterization of a cell-wall associated PPE protein
- 1998-2001 **Ph.D. Student**
University of Stellenbosch, Cape Town, South Africa
Characterization of genetic diversity of clinical isolates of *Mycobacterium tuberculosis*

Academic Qualifications

University of Stellenbosch, Cape Town, South Africa

- 2002 **Ph.D.**
Thesis title: “*Mycobacterium tuberculosis*: Genetic and Phenotypic Comparison”
- 1997 **M.Sc. (Medical Biochemistry)**, graduated *cum laude* (equivalent to 1st class)
Thesis title: “Characterization of mechanisms leading to *Mycobacterium tuberculosis* strain diversity”
- 1995 **B.Sc. Hons. (Medical Biochemistry)**, graduated *cum laude* (equivalent to 1st class)
- 1994 **B.Sc. (Chemistry and Biochemistry)**

Funding (selected grants, awarded in open competition)

- 2013-present South African Research Chair Initiative (SARChI) award; **ZAR7,500,000** (PI)
- 2016-2018 NRF Competitive Support for Unrated Researchers award; **ZAR1,015,000** (PI)
- 2015-2017 NRF-South Africa/Tunisia Research Cooperation Programme; **ZAR935,500** (co-PI)
- 2015 Royal Society (UK)/ Newton Fund International Exchanges Scheme; **£3,000** (PI)
- 2014 Harry and Doris Crossley Foundation Project funding, **ZAR10,950** and **ZAR9,900** (PI)
- 2006-2010 Wellcome Trust Research Career Development Fellowship; **£490,000** (PI)
- 2009-2010 Royal Society Research Grant; **£10,000** (PI)
- 2008-2009 Bill and Melinda Gates Foundation Grand Challenges Explorations Grant; **US\$100,000** (PI)

Citation Report

Source:	Google Scholar (last accessed March 2016)
Total citations:	1450
Average citations per year (2006-2015):	98
Average citations per article:	40
i10-index:	21
H-index:	19

Publications – journal articles

Newton-Foot M, Warren RM, **Sampson SL**, van Helden PD, Gey van Pittius NC. The plasmid-mediated evolution of the mycobacterial ESX (Type VII) secretion systems. *BMC Evol Biol.* 2016 16(1):62 *Impact Factor: 3.407*

Phelan JE, Coll F, Bergval I, Anthony RM, Warren RM, **Sampson SL** and 24 other authors. Recombination in *pe/ppe* genes contributes to genetic variation in *Mycobacterium tuberculosis* lineages. *BMC Genomics* (2016). 17:151 *Impact Factor: 3.99*

Sampson SL. Strength in Diversity: Hidden Genetic Depths of *Mycobacterium tuberculosis*. Invited Spotlight article, *Trends in Microbiology.* 2016. 24(2):82-84 *Impact Factor: 9.186*

Black P, De Vos M, Louw G, Van der Merwe R, Dippenaar A, Streicher E, Abdallah A, **Sampson S**, Victor T, Dolby T, Simpson J, Van Helden P, Warren R, Pain A. Whole genome sequencing reveals genomic heterogeneity and antibiotic purification in *Mycobacterium tuberculosis* isolates. *BMC Genomics.* 2015. 16(1):857 *Impact Factor: 3.99*

Dippenaar A, Parsons SDC, **Sampson SL**, Van der Merwe RG, Drewe JA, Abdallah AM, Siame KK, Gey van Pittius NC, Van Helden PD, Pain A, Warren RM. Whole genome sequence analysis of *Mycobacterium suricattae*. *Tuberculosis.* 2015. 95(6):682-8 *Impact Factor: 3.503*

Pule C, **Sampson SL** (corresponding author), Warren RM, Black P, Van Helden PD, Victor TC, Louw GE. Efflux pump inhibitors: targeting mycobacterial efflux systems to enhance TB therapy. *Journal of Antimicrobial Chemotherapy.* 2015. 71(1):17-26. *Impact Factor: 5.313*

Streicher EM, **Sampson SL**, Dheda K, Dolby T, Simpson J, Victor TC, Gey van Pittius NC, van Helden PD, Warren RM. Molecular epidemiological interpretation of the extensively drug resistant tuberculosis epidemic in South Africa *J Clin Microbiol.* 2015. 53(11):3650-3653 *Impact Factor: 3.993*

Whitfield MG, Warren RM, Streicher EM, **Sampson SL**, Sirgel F, Van Helden PD, Mercante A, Willby M, Hughes K, Birkness K, Morlock G, Van Rie A, Posey J. *Mycobacterium tuberculosis pncA* polymorphisms that do not confer pyrazinamide resistance at a breakpoint concentration of 100 µg/ml in MGIT. *J Clin Microbiol.* 2015 53(11):3633-5 *Impact Factor: 3.993*

Whitfield MG, Soeters HM, Warren RM, York T, **Sampson SL**, Streicher EM, van Helden PD, van Rie A. A Global Perspective on Pyrazinamide Resistance: Systematic Review and Meta-analysis. *PLOS ONE.* 2015 10(7):e0133869 *Impact Factor: 3.234*

Fishbein S, Van Wyk N, Warren RM, **Sampson SL**. Phylogeny to function: PE/PPE protein evolution and impact on *Mycobacterium tuberculosis* pathogenicity. *Molecular Microbiology.* 2015 doi: 10.1111/mmi. *Impact Factor: 5.026*

Fortuin S, Tomazella G, Nagaryan N, **Sampson S**, Gey van Pittius N, Soares N, Wiker H, De Souza G, Warren R. Phosphoproteomics analysis of a clinical *Mycobacterium tuberculosis* Beijing isolate: Expanding the mycobacterial phosphoproteome catalogue. *Frontiers in Microbiology, section Microbial Physiology and Metabolism.* 2015. doi: 10.3389/fmicb.2015.00006 *Impact Factor: 3.941*

Fang Z, **Sampson SL**, Warren RM, Gey van Pittius NC, Newton-Foot M. Iron acquisition Strategies in Mycobacteria. *Tuberculosis.* 2015. 95(2):123-130 *Impact Factor: 3.503*

Van der Merwe RG, Van Helden PD, Warren RM, **Sampson SL**, Gey van Pittius NC. Phage-based detection of bacterial pathogens. *Analyst.* 2014. DOI: 10.1039/C4AN00208C *Impact Factor: 3.969*

Sampson SL, Saraiva, L, Gustafsson K, Jayasinghe SN, Robertson BD. Cell electrospinning an *in vitro* and *in vivo* study. *Small.* 2014. 10(1):78-82, smll.201300804 *Impact Factor: 7.823*

Andreu N, Zelmer A, **Sampson SL**, Ikeh M, Bancroft GJ, Schaible UE, Robertson BD, Wiles S. Rapid *in vivo* assessment of drug efficacy against *Mycobacterium tuberculosis* using an improved firefly luciferase. *Journal of Antimicrobial Chemotherapy.* 2013. 68(9):2118-27 *Impact Factor: 5.338*

Publications - journal articles (continued)

- Vordermeier HM, Hewinson RG, Wilkinson RJ, Wilkinson KA, Gideon HP, Young DB, **Sampson SL**. Conserved Immune Recognition Hierarchy of Mycobacterial PE/PPE Proteins During Infection in Natural Hosts. *PLoS ONE*. 2012. 7(8): e40890. *Impact Factor: 3.730*
- Sampson SL**, Mansfield KG, Carville A, Magee DM, Quitugua TN, Howerth EW, Bloom BR, Hondalus MK. Extended safety and efficacy studies of a live attenuated double leucine and pantothenate auxotroph of *Mycobacterium tuberculosis* as a vaccine candidate. *Vaccine*. 2011 (29-30):4839-47 *Impact Factor: 3.492*
- Goldstone RM, Goonesekera SD, Bloom BR, **Sampson SL**. The transcriptional regulator Rv0485 modulates the expression of a *pe/ppe* gene pair and is required for *Mycobacterium tuberculosis* virulence. *Infect. Immun*. 2009 77(10):4654-67 *Impact Factor: 4.074*
- Wong YL, **Sampson SL**, Germishuizen WA, Goonesekera S, Caponetti G, Sadoff J, Bloom BR, Edwards D. Drying a tuberculosis vaccine without freezing. *PNAS*. 2007 104(8):2591-5 *Impact Factor: 9.737*
- Gey van Pittius NC, **Sampson SL**, Lee H, Kim Y, van Helden PD, Warren RM. Evolution and expansion of the *Mycobacterium tuberculosis* PE and PPE multigene families and their association with the duplication of the ESAT-6 (*esx*) gene cluster regions. *BMC Evol Biol*. 2006 6(1):95 *Impact Factor: 3.290*
- Sampson SL**, Dascher CC, Sambandamurthy VK, Russell RG, Jacobs WR Jr., Bloom BR, Hondalus MK. Protection elicited by a double leucine and pantothenate auxotroph of *Mycobacterium tuberculosis* in guinea pigs. *Infect Immun*. 2004 72(5):3031-7 *Impact Factor: 4.074*
- Sampson SL**, Richardson M, Van Helden, PD, Warren RM. IS6110-mediated deletion polymorphism in isogenic strains of *Mycobacterium tuberculosis*. *J Clin Microbiol*. 2004 42(2):895-8 *Impact Factor: 4.068*
- Richardson M, Van der Spuy GD, **Sampson SL**, Beyers N, Van Helden PD, Warren RM. Stability of Polymorphic GC-Rich Repeat Sequence-Containing Regions of *Mycobacterium tuberculosis*. *J Clin Microbiol*. 2004 42(3):1302-4 *Impact Factor: 4.074*
- Gey van Pittius NC, **Sampson SL**, Warren RM, van Helden PD. Genome variation in *Mycobacterium tuberculosis*. *South African Journal of Science*. 2004 465-470.
- Sampson SL**, Rengarajan J, Rubin, EJ. Bacterial genomics and vaccine design. *Expert Review of Vaccines*. 2003 2(3):437-445 *Impact Factor: 4.219*
- Sampson SL**, Warren RM, Richardson M, Victor TC, Jordaan AM, Van Der Spuy GD, Van Helden PD. IS6110-mediated deletion polymorphism in the DR region of clinical isolates of *Mycobacterium tuberculosis*. *J Bacteriol*. 2003 185(9):2856-66.
- Warren RM, Streicher EM, **Sampson SL**, Van Der Spuy GD, Richardson M, Nguyen D, Behr MA, Victor TC, Van Helden PD. Microevolution of the Direct Repeat Region of *Mycobacterium tuberculosis*: Implications for Interpretation of Spoligotyping Data. *J Clin Microbiol*. 2002 40(12):4457-65.
- Sampson SL**, Lukey P, Warren RM, van Helden PD, Richardson M, Everett MJ. Expression, characterization and subcellular localization of the *Mycobacterium tuberculosis* PPE gene Rv1917c. *Tuberculosis*. 2001 81(5-6):305-17.
- Sampson S**, Warren R, Richardson M, van der Spuy G, van Helden P. IS6110 insertions in *Mycobacterium tuberculosis*: predominantly into coding regions. *J Clin Microbiol*. 2001 39(9):3423-4.
- Upton AM, Mushtaq A, Victor TC, **Sampson SL**, Sandy J, Smith DM, van Helden PD, Sim E. Arylamine N-acetyltransferase of *Mycobacterium tuberculosis* is a polymorphic enzyme and a site of isoniazid metabolism. *Mol Microbiol*. 2001 42(2):309-17.
- Warren RM, Richardson M, **Sampson SL**, van der Spuy GD, Bourn W, Hauman JH, Heersma H, Hide W, Beyers N, van Helden PD. Molecular evolution of *Mycobacterium tuberculosis*: phylogenetic reconstruction of clonal expansion. *Tuberculosis* 2001 81(4):291-302.
- Warren RM, **Sampson SL**, Richardson M, Van Der Spuy GD, Lombard CJ, Victor TC, van Helden PD. Mapping of IS6110 flanking regions in clinical isolates of *Mycobacterium tuberculosis* demonstrates genome plasticity. *Mol Microbiol*. 2000 37(6):1405-16.
- Sampson SL**, Warren RM, Richardson M, van der Spuy GD, van Helden PD. Disruption of coding regions by IS6110 insertion in *Mycobacterium tuberculosis*. *Tuber Lung Dis*. 1999 79(6):349-59.
- Van Rie A, Warren RM, Beyers N, Gie RP, Classen CN, Richardson M, **Sampson SL**, Victor TC, van Helden PD. Transmission of a multidrug-resistant *Mycobacterium tuberculosis* strain resembling "strain W" among noninstitutionalized, human immunodeficiency virus-seronegative patients. *J Infect Dis*. 1999 180(5):1608-15.

Publications - journal articles (continued)

Warren R, Richardson M, Van der Spuy G, Victor T, **Sampson S**, Beyers N, van Helden P. DNA fingerprinting and molecular epidemiology of TB: use and interpretation in an epidemic setting. *Electrophoresis* 1999 20(8):1807-12

Warren R, Richardson M, **Sampson S**, Hauman JH, Beyers N, Donald PR, van Helden PD. Genotyping of *Mycobacterium tuberculosis* with Additional Markers Enhances Accuracy in Epidemiological Studies. *J Clin Microbiol.* 1996 34:2219-2224

Publications – book chapters

Loxton AG, Hondalus MK, **Sampson SL**. TB vaccine assessment. Book chapter in: *Delivery Systems for Tuberculosis Prevention and Treatment*; Wiley. Editors: Anthony J. Hickey, Amit Misra, P. Bernard Fourie. *In press*

Vordermeier M, Jones GJ, **Sampson SL**, Gordon SV. Post-genomic antigen discovery: bioinformatical approaches to reveal novel T-cell antigens of *Mycobacterium bovis*. Book chapter in: *Immunomic Discovery of Adjuvants and Candidate Subunit Vaccines*; Springer. Editors: Dr Darren Flower and Prof Yvonne Perrie, ISBN 978-1-4614-5069-6. *Immunomics Reviews*, Volume 5, 2013, pp 73-90

Scientific Presentations

Devastating Diseases and a Sustainable Society: Learning from the Tubercle Bacillus. Science for Sustainability conference, Amsterdam, The Netherlands, November 2015, Keynote Presentation

Whole genome sequence interrogation of drug resistant *Mycobacterium tuberculosis*. The Wellcome Trust Africa Centre Genomics Programme & UKZN MRC Flagship project seminar series, Durban, March 2015, Invited seminar

In vivo imaging of *Mycobacterium tuberculosis* infection. UK-SA Seminar on Imaging in Host-Pathogen Interactions, Cape Town, November 2014, Invited talk

Mice in TB Research – what’s new and how is this useful in a Southern African context? Southern African Consortium for Research Excellence TB workshop “Understanding and Intervening in tuberculosis in Southern Africa”. August 2013, Invited seminar.

TB Host-pathogen interactions. Antibodies and Immune Responses Subject Day. Prince’s Teaching Institute, UK. January 2012, Invited Lecture

Patent

United States Patent Number: US 7,758, 874 B2; Attenuated *Mycobacterium tuberculosis* vaccines. Jacobs WR Jr, Bloom BR, Hondalus MK, **Sampson SL**, Sambandamurthy V. July 2010

Publications - popular science writing

What needs to be added to South Africa’s anti-TB toolbox. The Conversation, 15 May 2015; Republished under Creative Commons licence by: Biznews , 16 May 2015; The Big Issue, 18 May 2015; SciBraai, 18 May 2015

Integrated approach to TB research: Key to success. Spice4life.co.za. 25 March 2014

Fresh Hope for MDR-TB patients. Sowetan. 24 March 2014

External Activities

- Invited reviewer of manuscripts for the following international journals: BBA – Molecular Cell Research, Frontiers in Cellular and Infection Microbiology, Immunobiology, Immunology, International Journal of Tuberculosis and Lung Disease, Journal of Cellular Physiology, Molecular Microbiology, Microbiology, PLoS One, PNAS, Tuberculosis
- Invited reviewer of funding applications for: Royal Society (UK), South African National Research Foundation, Portuguese Foundation for Science and Technology, Netherlands Organisation for Scientific Research, Research Council of Norway
- Professional Memberships: Association of South African Women in Science and Engineering, South African Society for Microbiology, South African Immunology Society, South African Society for Bioinformatics

Teaching Activities

Student supervision, Stellenbosch University:

- PhD (currently: 4 as primary supervisor, 4 as co-supervisor; graduated: 2 as co-supervisor)
- MSc (currently: 3 as primary supervisor, 3 as co-supervisor)
- BSc Hons (currently: 1 as primary supervisor, 1 as co-supervisor; graduated: 4 as primary supervisor)

Student supervision, Imperial College London:

- MRes (Masters in Research) Microbial Pathogenesis project students, 2009, 2010, 2011
- BSc Immunity and Infection project students, 2008, 2009, 2010, 2012
- Wellcome Trust PhD rotation students, 2006, 2011 (Co-supervised)

Module co-ordinator:

- BSc Immunity and Infection, Infection and Host responses Module, Imperial College London
- BSc Hons in Molecular Biology and Human Genetics, Mycobacteriology Module, Stellenbosch University

Lectures, Imperial College London:

- New Advances in TB vaccination; BSc Global Health
- TB Vaccines Old And New; BSc Immunity and Infection, BSc Medical Microbiology
- *M. tuberculosis* ESX virulence locus; BSc Immunity and Infection
- TB Animal Models; BSc Immunity and Infection; MRes Microbial Pathogenesis
- *M. tuberculosis* ESX virulence locus; BSc Immunity and Infection
- TB Host-pathogen interactions, MSc Molecular Medicine

Tutoring:

- Problem-based learning: Doctor and Patient course (Year 1), 2008

Teaching courses attended, Centre for Educational Development, Imperial College London:

- Supporting Teaching and Learning Programme (SLTP), February - December 2011
- A Practical Introduction to Problem Based Learning (PBL), September 2007
- Communicating Knowledge, September 2007
- Starting teaching for postdocs Modules 1 & 2, June 2007
- Issues and techniques for one-off teaching sessions, February 2007
- Assisting with PhD supervision, February 2007

Personal Development

- HERS-SA Academy, a week-long professional development opportunity for the advancement and leadership development of women in the Higher Education sector, September 2015
- Managing your first research group Workshop, Imperial College, April 2013
- Selected participant in TANDEMplusIDEA, an EU-funded international mentoring, networking and training programme, 2008-2009
- Research Proposal Development Workshop, Imperial College, November 2009
- Personal Review and Development Plan - Reviewers training workshop, Imperial College, February 2009
- Effective Recruitment & Selection workshop, Imperial College, October 2006

Skills and experience summary

- Over 20 years experience in the TB research field.
- Extensive molecular, microbiological and immunological experience.
- Experience with 4 different TB animal models and *in vitro* (macrophage) infection models
- Have contributed to development of SOPs for category 3 containment labs, and have trained and managed students, technicians and post-doctoral researchers working in this setting.
- Management: Have managed day-to-day running of laboratory, research budgets and personnel. In my previous position, I trained and supervised 3 technicians, 4 undergraduate and 5 post-graduate students. I currently supervise or co-supervise 15 post-graduate students (MSc and PhD) and 3 post-doctoral fellows.
- Teaching: Graduate and undergraduate research project supervision, give lectures and tutorials and participate in student assessments; was responsible for the “Host Responses to Infection” module on Imperial College BSc Immunity and Infection course - this involved development of course content, setting and marking exams, student assessments and related administrative responsibilities. I currently co-ordinate the “Mycobacteriology” module of our Departmental BSc Hons course.
- Good Clinical Practice (GCP) Level 2 certificate

Contact Details

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