

NAME: Scheepers, Cathrine (maiden name: Mitchell)

DATE OF BIRTH: 18-05-1983

PLACE OF BIRTH: Johannesburg, South Africa

NATIONALITY: South African

ORCID: 0000-0002-1683-0282

POSITION TITLE: Senior Medical Scientist

EDUCATION:

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of the Witwatersrand, South Africa	BSc	12/2003	Molecular and Cell Biology
University of the Witwatersrand, South Africa	BSc (Hons)	12/2004	Human Genetics
University of the Witwatersrand, South Africa	MSc (Med)	04/2008	Human Genetics
University of Cambridge, UK	MPhil	10/2008	Computational Biology
University of the Witwatersrand, South Africa	PhD	08/2015	Virology

Contact

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Personal Statement

Cathrine has spent the last 9 years studying antibody development and the genetic diversity of germline immunoglobulin genes in the context of antibody responses to HIV infection in South African individuals from KwaZulu-Natal, a region most affected by the HIV pandemic. Having qualifications in both molecular and computational biology has proven invaluable in Cathrine's research involving large high throughput datasets. This work has highlighted the high diversity of germline IGHV genes in this population and the need for a fully comprehensive immunoglobulin gene database particularly for African populations who are largely underrepresented in most genomic databases. Part of a collaboration with Dr Mary Carrington at the National Cancer Institute, she has examined genetic variation in the Fc region of antibodies and discovered previously unreported variation in these genes as well. Cathrine joined the Adaptive Immunity Receptor Repertoire (AIRR) community in 2015 and became part of the Germline Gene Database working group in 2016. The aim of the AIRR community is to set guidelines for minimal standards for adaptive immune receptor repertoire studies as well as a common repository for tools, resources and data sharing. In 2017, Cathrine joined the Inferred Alleles Review Committee (IARC), part of the AIRR community who is tasked with reviewing evidence for inferred germline gene alleles from antibody repertoire data and to make recommendations for their inclusion into the IMGT database (www.imgt.org), the gold standard database for immunogenetics data. Cathrine was recently nominated by Prof. Marie-Paule LeFranc to co-chair the IG, TR, MH (IMGT) nomenclature sub-committee.

Positions and Honors

Positions and Employment

2016-present: Senior Medical Scientist, National Institute for Communicable Diseases, Johannesburg, South Africa

2016-present: Researcher, University of the Witwatersrand, Johannesburg, South Africa

2015-2016: Medical Scientist, National Institute for Communicable Diseases, Johannesburg, South Africa

2009-2010: Computational Biologist for SimuGen, Malaysia and UK, based in London.

Other Experience and Professional Membership

2019-present: Co-Chair of the IG, TR and MH nomenclature committee

2018-present: Member of the HIV/AIDS working group of the H3Africa Consortium

2017-present: Member of the Inferred Allele Review Committee (IARC)

2016-present: Member of the Germline Database Working Group of the AIRR Community

2015-present: Member of the Adaptive Immune Receptor Repertoire (AIRR) Community, part of The Antibody Society

2013-present: Member of the South African Immunology Society

Honors

2019: IMGT-Nomenclature Award

2016: Second best oral presentation at South African Immunology Society

2014: HIV R4P Conference Scholarship

2013: SA AIDS Conference Scholarship

2013: Global Travel Award

2013: Columbia University-South African Fogarty AITRP Traineeship

2012: 3-year National Research Foundation Scholarship

2012: Columbia University-South African Fogarty AITRP Traineeship

2012: Roche GS Junior Sequencing Competition Winner

2011: 3-year Poliomyelitis Research Foundation Scholarship

2011: 3-year Poliomyelitis Research Foundation Grant

2007: Commonwealth Cambridge Shared Scholarship Award

2005: University of the Witwatersrand Postgraduate Merit Award

Research Support

1U01AI136677-01 - Morris L (PI) - H3Africa/NIH 08/18/2017 - 08/31/2022
Immunoglobulin gene diversity in an African population and impact on antibody function in HIV infection

Poliomyelitis Research Foundation Grant (16/23) – Scheepers C (PI) 05/01/2016 - 30/04/2019
Co-evolution of a strain-specific antibody lineage and its viral epitope during HIV-1 subtype C infection

1R01AI104387-01A1 - Morris L (PI) – NIAID/NIH 08/01/2013 - 07/31/2018
Evolution of glycan-reactive broadly neutralizing anti-V2 antibodies in HIV infection

South African Medical Research Council - Morris L (PI) 01/01/2014 - 12/31/2018
Flagship project: Antiviral properties of HIV vaccine-elicited antibodies

Peer Reviewed Publications

Selected publications

1. **Scheepers C**, Shrestha RK, Lambson BE, Jackson KJ, Wright IA, Naicker D, Goosen M, Berrie L, Ismail A, Garrett N, Abdool Karim Q, Abdool Karim SS, Moore PL, Travers SA, Morris L. *Ability to develop broadly neutralizing HIV-1 antibodies is not restricted by the germline Ig gene repertoire*. J Immunol. 2015 May 1;194(9):4371-8. doi: 10.4049/jimmunol.1500118. Epub 2015 Mar 30. PubMed PMID: 25825450; PubMed Central PMCID: PMC4513073.
2. Ohlin M, **Scheepers C**, Corcoran M, Lees WD, Busse CE, Bagnara D, Thörnqvist L, Bürckert JP, Jackson KJL, Ralph D, Schramm CA, Marthandan N, Breden F, Scott J, Matsen Iv FA, Greiff V, Yaari G, Kleinstein SH, Christley S, Sherkow JS, Kossida S, Lefranc MP, van Zelm MC, Watson CT, Collins AM. *Inferred Allelic Variants of Immunoglobulin Receptor Genes: A System for Their Evaluation, Documentation, and Naming*. Front Immunol. 2019 Mar 18;10:435. doi: 10.3389/fimmu.2019.00435. eCollection 2019. Review. PubMed PMID: 30936866; PubMed Central PMCID: PMC6431624.
3. Lees W, Busse CE, Corcoran M, Ohlin M, **Scheepers C**, Matsen FA, Yaari G, Watson CT, Collins A, Shepherd AJ. *OGRDB: a reference database of inferred immune receptor genes*. Nucleic Acids Res. 2019 Sep 30. doi: 10.1093/nar/gkz822. [Epub ahead of print] PubMed PMID: 31566225.

Additional Publications:

4. Mabvakure BM, Rott R, Dobrowsky L, Van Heusden P, Morris L, **Scheepers C** and Moore PL. *Advancing HIV Vaccine Research with low-cost high-performance computing infrastructure: An alternative approach for resource-limited settings*. SAGE. 2019. In press
5. Mabvakure BM, **Scheepers C**, Garrett N, Abdool Karim S, Williamson C, Morris L, Moore PL. *Positive Selection at Key Residues in the HIV Envelope Distinguishes Broad and Strain-Specific Plasma Neutralizing Antibodies*. J Virol. 2019 Mar 5;93(6). pii: e01685-18. doi: 10.1128/JVI.01685-18. Print 2019 Mar 15. PubMed PMID: 30567996; PubMed Central PMCID: PMC6401460
6. Mabvakure BM, Lambson BE, Ramdayal K, Masson L, Kitchin D, Allam M, Karim SA, Williamson C, Passmore JA, Martin DP, **Scheepers C**, Moore PL, Harkins GW, Morris L. *Evidence for both intermittent and persistent compartmentalization of HIV-1 in the female genital tract*. J Virol. 2019 Mar 6. pii: JVI.00311-19. doi: 10.1128/JVI.00311-19. [Epub ahead of print] PubMed PMID: 30842323.
7. Van Eeden C, Wibmer CK, **Scheepers C**, Richardson SI, Nonyane M, Lambson B, Mkhize NN, Vijayakumar B, Sheng Z, Stanfield-Oakley S, Bhiman JN, Bekker V, Hermanus T, Mabvakure B, Ismail A, Moody MA, Wiehe K, Garrett N, Karim SA, Dirr H, Fernandes MA, Sayed Y, Shapiro L, Ferrari G, Haynes BF, Moore PL, Morris L. *V2-Directed Vaccine-like Antibodies from HIV-1 Infection Identify an Additional K169-Binding Light Chain Motif with Broad ADCC Activity*. Cell Rep. 2018 Dec 11;25(11):3123-3135.e6. doi: 10.1016/j.celrep.2018.11.058. PubMed PMID: 30540944; PubMed Central PMCID: PMC6342559.
8. Setliff I, McDonnell WJ, Raju N, Bombardi RG, Murji AA, **Scheepers C**, Ziki R, Mynhardt C, Shepherd BE, Mamchak AA, Garrett N, Karim SA, Mallal SA, Crowe JE Jr, Morris L, Georgiev IS. *Multi-Donor Longitudinal Antibody Repertoire Sequencing Reveals the Existence of Public Antibody Clonotypes in HIV-1 Infection*. Cell Host Microbe. 2018 Jun 13;23(6):845-854.e6. doi: 10.1016/j.chom.2018.05.001. Epub 2018 May 31. PubMed PMID: 29861170; PubMed Central PMCID: PMC6002606.
9. **Scheepers C**, Chowdhury S, Wright WS, Campbell CT, Garrett NJ, Abdool Karim Q, Abdool Karim SS, Moore PL, Gildersleeve JC, Morris L. *Serum glycan-binding IgG antibodies in HIV-1 infection and during the development of broadly neutralizing responses*. AIDS. 2017 Oct 23;31(16):2199-2209. doi: 10.1097/QAD.0000000000001643. PubMed PMID: 28926408; PubMed Central PMCID: PMC5633525.
10. Mabvakure B, **Scheepers C**, Nonyane M, Lambson B, Madzorera S, Kitchin D, Bhiman J, Wibmer K, Abdool Karim S, Williamson C, Morris L, Moore PL. *A38 Diversity analyses of HIV-1 envelope glycoproteins in HIV-infected individuals with and without broadly neutralizing antibodies*. Virus Evol. 2017 Mar 5;3(Suppl 1). pii: vew036.037. doi: 10.1093/ve/vew036.037. eCollection 2017 Mar. PubMed PMID: 28845277; PubMed Central PMCID: PMC5565991.
11. **Mitchell C**, Gregersen N, Krause A. *Novel CYP2C9 and VKORC1 gene variants associated with warfarin dosage variability in the South African black population*. Pharmacogenomics. 2011 Jul;12(7):953-63. doi: 10.2217/pgs.11.36. Epub 2011 Jun 2. PubMed PMID: 21635147.
12. Wills Q, **Mitchell C**. *Toxicogenomics in drug discovery and development -- making an impact*. Altern Lab Anim. 2009 Sep;37 Suppl 1:33-7. PubMed PMID: 19807202
13. **Mitchell C**, Mitchell CL, Krause A. *New FACTOR IX linked marker alleles in African Haemophilia B patients*. Haemophilia. 2007 Sep;13(5):642-4. PubMed PMID: 17880456.