



Curriculum Vitae

CARMEN PHEIFFER

CONTACT DETAILS

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QUALIFICATIONS

SCIENCE

MASTER'S IN PUBLIC HEALTH 2020, UNIVERSITY OF CAPE TOWN

Specialization: Epidemiology and Biostatistics

PhD 2004, MEDICAL BIOCHEMISTRY, STELLENBOSCH UNIVERSITY

Title: Investigation of *Mycobacterium tuberculosis* protein expression and analysis of humoral immune responses of TB patients.

MSc 1998, CHEMICAL PATHOLOGY, UNIVERSITY OF CAPE TOWN

Title: The role of steroidogenic factor-1 (SF-1) in gonadotropin-releasing hormone (GnRH) receptor gene regulation. The degree was awarded with distinction and received the Joseph Arnow prize for the best MSc thesis in the Faculty of Health Sciences.

BSc (Hons) 1994, MEDICAL MICROBIOLOGY, UNIVERSITY OF CAPE TOWN

Title: Vancomycin resistance in *Enterococcus faecium*.

BSc 1993, MOLECULAR AND CELL BIOLOGY, UNIVERSITY OF CAPE TOWN

Majors: Biochemistry and Microbiology. Other courses included Mathematics, Physics, Chemistry and Biology.

MANAGEMENT

BA (HONS) BUSINESS MANAGEMENT 2014, UNIVERSITY OF LINCOLN, UNITED KINGDOM

Degree awarded with First Class Honours.

SENIOR MANAGEMENT DEVELOPMENT PROGRAMME 2009, UNIVERSITY OF STELLENBOSCH BUSINESS SCHOOL

Certificate awarded with distinction.

MANAGEMENT DEVELOPMENT PROGRAMME 2008, UNIVERSITY OF STELLENBOSCH BUSINESS SCHOOL

Certificate awarded with distinction.

OTHER COURSES

- 2015** Fundamentals of Epidemiology short course (distinction), University of Stellenbosch
- 2010** Good Laboratory Practice, CDM Training Solutions
- 2009** Quantitative PCR and Biostatistics course, TATAA Biosciences, Technical University of Germany, Germany
- 2009** Project Management (distinction), Cape Peninsula University of Technology
- 2005** Introduction to the Principles and Processes of Research, Research Development and Support, University of Stellenbosch
- 2004** Good Clinical Practice, Bioethics Unit, Faculty of Health Sciences, University of Stellenbosch, South Africa
- 2001** Proteomics Workshop, University of Cape Town, South Africa

EMPLOYMENT HISTORY

BIOMEDICAL RESEARCH & INNOVATION PLATFORM (BRIP), SOUTH AFRICAN MEDICAL RESEARCH COUNCIL (SAMRC)

Senior Specialist Scientist	September 2019 - current
Specialist Scientist (S)	Aug 2011 – August 2019
Specialist Scientist (E)	May 2008 – Jul 2011
Senior Scientist (C)	Feb 2007 – Apr 2008

RESEARCH AREA

Obesity, Type 2 diabetes, Gestational diabetes, Breast Cancer, Epigenetics, Molecular Biology

RESPONSIBILITIES

Peer-review publications
Capacity development
Income generation
Project management
Research translation

CENTRE FOR TUBERCULOSIS RESEARCH, STELLENBOSCH UNIVERSITY

Researcher	Apr 2004 – Jan 2007
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RESEARCH AREA

Tuberculosis, Microbiology, Molecular Biology

RESPONSIBILITIES

Operations manager	BSL3 laboratory
Laboratory manager	ZAMSTAR Prevalence study

TUBERCULOSIS GROUP, GLAXOSMITHKLINE RESEARCH & DEVELOPMENT, STEVENAGE, UK

Student Researcher	Jan 1999 – Jun 1999
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RESEARCH AREA

Tuberculosis, Molecular Biology

RESPONSIBILITIES

Conduct proteomic analysis of *Mycobacterium tuberculosis*

DIVISION OF MOLECULAR BIOLOGY AND HUMAN GENETICS, UNIVERSITY OF STELLENBOSCH

Research Assistant	Mar 1998 – Dec 1998
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RESEARCH AREA

Oesophageal Cancer, Genetics

RESPONSIBILITIES

Research, analysis and presentation

HUMAN GENETICS, UNIVERSITY OF CAPE TOWN

Research Assistant	Jan 1997 – Feb 1998
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RESEARCH AREA

Muscular Dystrophy, Genetics

RESPONSIBILITIES

Diagnostic and research analysis

VIROLOGY, UNIVERSITY OF CAPE TOWN

Research Assistant	Jan 1995 – Apr 1995
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RESEARCH AREA

Hepatitis C, Molecular Biology

RESPONSIBILITIES

Subtype Hepatitis C

FUNDING

- National Research Foundation, Competitive Support for Rated Researchers (2020-2022)
- National Research Foundation, Incentive funding (2019)
- National Research Foundation of South Africa, Professional Development Programme (2017-2019)
- Agricultural Research Council (2015-2017)
- SAMRC competitive intramural funding (2016)
- NRF travel award (2015)
- Stellenbosch University, Harry Crossley research funding (2015)
- NRF Thuthuka funding (2014- 2016)
- SAMRC, Development grant (2013-2014)
- NRF Thuthuka funding (2006-2007)
- Fogarty Training Fellowship, Public Health Research Institute, USA (2005)
- Stellenbosch University, Harry Crosley Award (2002 – 2003)
- GlaxoSmithKline PhD bursary (2000 – 2003)

AWARDS

- Science by Women Fellowship, Foundation for Women in Africa, April 2019-June 2019, Vall d’Hebron Research Institute, Spain.
- National Research Foundation C2-rating 2019-2024
- International Conference on Obesity and Weight Management, San Francisco, US (2014). Best poster presentation
- Students won prizes at national/international conference presentations (2008, 2011, 2015, 2017)
- Director’s award, University of Stellenbosch Business School (2009)
- Joseph Arnow award, Masters dissertation, Faculty of Health Sciences, University of Cape Town (1998)

PEER REVIEWED PUBLICATIONS

1. Mendham, Amy E., Larsen, Steen., George, Cindy, Pheiffer, Carmen., Goedecke, Julia. Scientific Reports, 2020;10(1):3785. Exercise training results in depot-specific adaptations to adipose tissue mitochondrial function.
2. Dias S, Adam S, Rheeder P, Louw J, Pheiffer C. International Journal of Molecular Sciences 2019, 20, 5828. Altered Genome-Wide DNA Methylation in Peripheral Blood of South African Women with Gestational Diabetes Mellitus.
3. Samodien E, Pheiffer C, Erasmus M, Johnson R. Food Science & Nutrition. 2019 7(10):3131-3145. Diet-induced DNA methylation within the hypothalamic arcuate nucleus and dysregulated leptin and insulin signaling in the pathophysiology of obesity.
4. Jack BU, Malherbe CJ, Mamushi M, Muller CJF, Joubert E, Louw J, Pheiffer C. Biomedical Pharmacotherapy 2019 Oct 3;120:109439. Adipose tissue as a possible therapeutic target for polyphenols: A case for *Cyclopia* extracts as anti-obesity nutraceuticals.
5. Huisamen B, van Vuuren M, Pheiffer C. Chapter 4. Anti-obesity effects of an aqueous extract of Buchu. In Medicinal Effects of Agathosma (Buchu) Extracts, edited by Barbara Huisamen, Page 55-72. Cape Town: AOSIS, 2019.
6. Mabasa L, Samodien E, Sangweni NF, Pheiffer C, Louw J, Johnson R. Molecular Nutrition Food Research 2019 Aug 13:e1900377. In Utero One-Carbon Metabolism Interplay and Metabolic Syndrome in Cardiovascular Disease Risk Reduction.
7. Samodien E, Johnson R, Pheiffer C, Mabasa L, Erasmus M, Louw J, Chellan N. Molecular Metabolism 2019, June 29. Diet-induced hypothalamic dysfunction and metabolic disease, and the therapeutic potential of polyphenols.
8. Dias S, Adam S, Rheeder P, Pheiffer C. South African Medical Journal 2019;109(7):463-467. Prevalence of and risk factors for gestational diabetes mellitus in South Africa.
9. Dias S, Pheiffer C, Rheeder P, Adam S. South African Medical Journal 2019;109(7):457-462. Screening and diagnosis of gestational diabetes mellitus in South Africa: What we know so far.
10. Adam S, Dias S, Rheeder P, Pheiffer C. South African Medical Journal 2019;109(7):455-456. Does South Africa need a diabetes-in-pregnancy study group?
11. Pheiffer C, Dias S, Rheeder P, Adam S. Molecular Diagnosis Therapy 2019 May 20. Profiling in HIV-Infected South African Women with Gestational Diabetes Mellitus.

12. Willmer T, Johnson R, Louw J, Pfeiffer C. *Frontiers Endocrinology* 2018 Dec 4;9:744. eCollection 2018. Blood based DNA methylation biomarkers for type 2 diabetes: potential for clinical applications
13. Pfeiffer C, Dias S, Rheeder P, Adam S. Screening for Gestational diabetes mellitus: The potential of microRNAs, in: Ray A (ed.) *Gestational diabetes* (ISBN 978-953-51-6619-1).
14. Dias S, Adam S, Van Wyk N, Rheeder P, Louw J, Pfeiffer C. *Biomarkers*. 2018;27:1-28. Global DNA methylation profiling in peripheral blood cells of South African women with gestational diabetes mellitus.
15. Dlodla PV, Jack B, Viraragavan A, Pfeiffer C, Johnson R, Louw J, Muller CJF. *Toxicology Reports*. 2018;5:1014-1020. A dose-dependent effect of dimethyl sulfoxide on lipid content, cell viability and oxidative stress in 3T3-L1 adipocytes.
16. Dias S, Pfeiffer C, Abrahams Y, Rheeder P, Adam S. *International Journal Molecular Sciences*. 2018 Sep 26;19(10). pii: E2926. Molecular Biomarkers for Gestational Diabetes Mellitus.
17. Pfeiffer C, Pillay-van Wyk V, Joubert JD, Levitt N, Nglazi MD, Bradshaw D. *BMJ Open*. 2018 Jul 11;8(7):e021029. The prevalence of type 2 diabetes in South Africa: a systematic review protocol.
18. Pfeiffer C, Dias S, Willmer T, Pace R, Aagaard K, Louw J. *Experimental and Clinical Endocrinology & Diabetes* 2018 Jun 11. Altered microRNA expression during Impaired Glucose Tolerance and High-fat Diet Feeding.
19. Pfeiffer C, Dias S, Rheeder P, Adam S. *Molecular Diagnosis Therapy* 2018, 22(3), 345-352. Decreased Expression of Circulating miR-20a-5p in South African Women with Gestational Diabetes Mellitus.
20. Adam S, Pfeiffer C, Dias S, Rheeder P. *Biomarkers*. 2018 February Feb 6:1-6. Association between gestational diabetes and biomarkers: A role in diagnosis.
21. Jack BU, Malherbe CJ, Willenburg EL, de Beer D, Huisamen B, Joubert E, Muller CJF, Louw J, Pfeiffer C. *Planta Medica* 2017 84:100-110. Polyphenol-Enriched Fractions of *Cyclopia intermedia* Selectively Affect Lipogenesis and Lipolysis in 3T3-L1 Adipocytes.
22. Dias S, Hemmings S, Muller C, Louw J, Pfeiffer C. *Biomed Research International*. 2017:1080157. MicroRNA Expression Varies according to Glucose Tolerance, Measurement Platform, and Biological Source.
23. Matsha TE, Pfeiffer C, Mutize T, Erasmus RT, Kengne AP. *Journal of Diabetes Research* 2016:8738072. Glucose Tolerance, MTHFR C677T and NOS3 G894T Polymorphisms, and Global DNA Methylation in Mixed Ancestry African Individuals.
24. Matsha TE, Pfeiffer C, Humphries SE, Gamielidien J, Erasmus RT, Kengne AP. *International Journal of Endocrinology* 2016:3172093. Genome-wide DNA methylation in mixed ancestry individuals with diabetes and prediabetes from South Africa.
25. Jack BU, Malherbe CJ, Huisamen B, Gabuza K, Mazibuko-Mbeje S, Schulze AE, Joubert E, Muller CJF, Louw J, Pfeiffer C. *South African Journal Botany* 2016:08.007. A polyphenol-enriched fraction of *Cyclopia intermedia* decreases lipid content in 3T3-L1 adipocytes and reduces body weight gain of obese db/db mice.
26. Pfeiffer C, Erasmus RT, Kengne AP, Matsha TE. *Clinical Biochemistry* 2016, 49:433-8. Differential DNA methylation of microRNAs within promoters, intergenic and intragenic regions of type 2 diabetic, pre-diabetic and non-diabetic individuals.
27. Pfeiffer C, Jacobs C, Patel O, Ghoor S, Muller C, Louw J. *Journal Physiology and Biochemistry* 2016: 72, 25-32. Expression of UCP2 in Wistar rats varies according to age and the severity of obesity.
28. Pfeiffer C, Dias S, Muller C, Louw J. *Journal Physiology and Biochemistry* 2014: 70, 725-33. Decreased global DNA methylation in the white blood cells of high fat diet fed vervet monkeys (*Chlorocebus aethiops*).
29. Sanderson M, Muller C, Joubert E, De Beer D, Mazibuko S, Johnson R, Pfeiffer C, Louw J. *Phytomedicine* 2014: 21, 109-17. Effects of Fermented rooibos (*Aspalathus linearis*) on 3T3-L1 preadipocyte differentiation.
30. Muller C, Joubert E, Pfeiffer C, Ghoor S, Sanderson M, Chellan N, Fey SJ, Louw J. *Journal Molecular Nutrition & Food Research* 2013: 57, 2216-22. Z-2-(β -D-glucopyranosyloxy)-3-phenylpropenoic acid, an α -hydroxy acid from rooibos (*Aspalathus linearis*) with hypoglycaemic activity.
31. Pfeiffer C, Dudhia Z, Louw J, Muller C, Joubert E. *Phytomedicine* 2013: 20, 1168-71. *Cyclopia maculata* (honeybush tea) stimulates lipolysis in 3T3-L1 adipocytes.
32. Dudhia Z, Louw J, Muller C, Joubert E, De Beer D, Kinnear C, Pfeiffer C. *Phytomedicine* 2013: 20, 401-8. *Cyclopia maculata* and *Cyclopia subternata* (honeybush tea) inhibits adipogenesis in 3T3-L1 pre-adipocytes.
33. Shi L, Sohaskey CD, Pfeiffer C, Parks M, McFadden J, North RJ, and Gennaro ML. *Molecular Microbiology* 2010: 78, 1199-215. Carbon flux rerouting during *Mycobacterium tuberculosis* growth arrest.
34. Pfeiffer C, Carroll NM, Beyers N, Donald P, Duncan K Uys P, van Helden P. *International Journal against Tuberculosis and Lung Disease* 2008: 12, 792-798. Time to detection of *Mycobacterium tuberculosis* in BACTEC systems as a viable alternative to colony counting.

35. Carroll NM, Uys P, Hesselning A, Lawrence K, Pheiffer C, Salker F, Duncan K, Beyers N, van Helden PD. Tuberculosis 2008; 88, 624-30. Prediction of delayed treatment response in pulmonary tuberculosis: Use of Time to Positivity values of Bactec cultures.
36. Babb C, van der Merwe L, Beyers N, Pheiffer C, Walzl G, Duncan K, van Helden P, Hoal EG. Tuberculosis 2007; 87, 295-302. Vitamin D receptor gene polymorphisms and sputum conversion time in pulmonary tuberculosis patients.
37. Pheiffer C, Betts JC, Flynn HR, Lukey PT, van Helden P. Microbiology 2005; 151, 1139-1150. Protein expression by a Beijing strain differs from that of another clinical isolate and M. tuberculosis H37Rv.
38. Pheiffer C, Betts J, Lukey P, van Helden P. Clinical Chemistry and Laboratory Medicine 2002; 40, 869-875. Protein Expression in Mycobacterium tuberculosis Differs According to Growth Stage and Strain Type.

CAPACITY DEVELOPMENT

POSTGRADUATE STUDENTS

In progress

1. PhD University of Pretoria (2020-2022) Nompumelelo Malaza. The identification of epigenetic signatures associated with glycaemic control and pregnancy outcome. Supervisor
2. MSc University of Pretoria (2020-2021) Matladi Masete. Circulating microRNA profiling in pregnancies complicated by diabetes. Supervisor
3. MSc University of Western Cape (2019-2021) Amina Parker. Synthesis and evaluation of metformin derivatives for anti-diabetes. Co-supervisor
4. PhD University of Stellenbosch (2018-2021) Hayley Jackson. Examining the impact of menopausal hormone therapy on obesity-related breast cancer. Co-supervisor
5. PhD University of Zululand (2017-2021) Amsha Viraragavan. DNA methylation and modulating effects by an aspalathin-enriched rooibos extract in the adipose tissue of obese Wistar rats. Supervisor
6. PhD University of Stellenbosch (2017-2021) Asive Myatza. Epigenetic regulation and modulating effects by an aspalathin-enriched rooibos extract in skeletal muscle of obese, insulin resistant Wistar rats. Supervisor
7. PhD University of Stellenbosch (2017-2021) Mr Yoonus Abrahams. A study investigating the epigenetic effects of diet-induced obesity and polyphenols in the liver of Wistar rats. Supervisor
8. PhD University of Zululand (2017-2021) Samukelisiwe Shabalala. Identification of DNA methylation-induced changes in gene expression in the heart and liver of high-fat-induced obesity in Wistar rats. Co-supervisor
9. PhD University of Stellenbosch (2017-2021) Tracey Jooste. Identification of novel DNA methylation signatures in the development of cardiac dysfunction. Co-supervisor
10. PhD University of Stellenbosch (2017-2021) Melisse Scheepers. Aberrant DNA methylation of LOXL2 predicts the development of heart failure. Co-supervisor
11. PhD University of Limpopo (2017-2021) Miss Pirwana Kholofelo Chokoe. Integrative analysis of epigenetic modifications in a breast cancer cell line treated with a bioactive extract of *Dicerocaryum senecioides*. Co-supervisor

Graduated

1. PhD University of Pretoria 2020 Stephanie Dias. The effect of gestational hyperglycemia on maternal and fetal epigenetic programming. Supervisor
2. MSc University of Stellenbosch 2020 Mokadi Peggy Mamushi. Investigating the ameliorative potential of *Aspalathus linearis* and *Cyclopia intermedia* against lipid accumulation, lipolysis, oxidative stress and inflammation. Supervisor
3. BSc (Hons) Stellenbosch University 2017 Nastasja Van Wyk. Investigating Global DNA Methylation during Gestational Diabetes Mellitus. Supervisor
4. MSc University of Stellenbosch 2017 Philbé-Jeanne Alley. An investigation of differentially methylated microRNAs in Type 2 diabetes. Supervisor
5. PhD University of Stellenbosch 2016 Babalwa Jack. An investigation into the anti-obesity properties of *Cyclopia*. Supervisor
6. MSc Cape Peninsula University of Technology 2016 (degree with distinction) Tinashe Mutize. Investigating DNA Methylation as a risk factor for type 2 diabetes. Supervisor
7. MSc University of Stellenbosch 2016 (degree with distinction) Stephanie Dias. Investigating DNA methylation and microRNAs during type 2 diabetes. Supervisor
8. MSc University of Western Cape 2013 Carvern Jacobs. The effect of *Cyclopia maculata* treatment on AMPK expression and adipocyte size in Wistar rats. Supervisor

9. MSc University of Western Cape 2012 Oelfah Patel. The effect of *Cyclopia maculata* on adipogenesis and adipolysis in Wistar rats. Supervisor
10. MSc University of Stellenbosch 2012 Zulfaqr Dudhia. The effect of *Cyclopia maculata* on lipogenesis and lipolysis in 3T3-L1 adipocytes. Supervisor
11. MSc University of Zululand 2011 Sithandiwe Mazibuko. *In vitro* exposure of muscle and adipocytes derived cells to Free Fatty acid, affects insulin actions, glucose uptake and utilization. Co-supervisor
12. Mtech Cape Town University of Technology 2008 Clarissa Kruger. Nontuberculosis mycobacteria in TB epidemic settings in Southern Africa. Supervisor
13. BSc (Hons) University of Zululand 2008 Sithandiwe Mazibuko. Myoblast derived cell lines differ in insulin induced glucose uptake: an *in vitro* assessment of C2C12 and L6 cells. Co-supervisor

NRF INTERNS

- 2017. Mokadi Peggy Mamushi, Limpopo
- 2016. Zesuliwe Shangase, KwaZulu Natal
- 2015. Khanyisile Mngomezulu, KwaZulu Natal
- 2014. Stephanie Dias, Western Cape

ENTRUSTED ACTIVITIES

- Member of SAMRC Scientific Review Committee
- Grant review
 - NRF
 - SAMRC
 - INRA - Centre de recherche Angers-Nantes, France
- Journal review
 - African Health Sciences
 - Aids Research and Treatment
 - Biomarkers in Medicine
 - BMC Complementary and Alternative Medicine
 - Clinical Epigenetics
 - Diabetes, Metabolic Syndrome and Obesity
 - Environmental Toxicology and Pharmacology
 - Epigenomics
 - European Journal of Clinical Microbiology & Infectious Diseases
 - Food and Chemical Toxicology
 - Frontiers in Genetics
 - Future Medicine
 - Genetic Testing and Molecular Biomarkers
 - Journal of Agricultural Food Chemistry
 - Journal of Food Medicine
 - Journal of Molecular Sciences
 - Medical Science Monitor
 - Medicinal Food
 - Pharmacy & Pharmacology
 - PloS ONE
 - Phytotherapy Research
- Examiner (Hons, MSc and PhD)
 - Sefako Makgatho Health Sciences University, Public Health
 - University of Stellenbosch, Departments of Physiology and Biomedical Sciences
 - University of the Western Cape, Department of Biotechnology
 - Cape Peninsula University of Technology, Department of Biomedical Sciences
 - Nelson Mandela University, Department of Biochemistry and Microbiology
 - University of Cape Town, Departments of Human Biology and Hematology
- Lecturer
 - Stellenbosch University, Departments of Biotechnology & Biomedical Sciences
- SAMRC Employment Equity Representative (2010-2013)

SCIENTIFIC MEETINGS

International

- Keystone: Drivers of Type 2 Diabetes: From Genes to Environment, Seoul, South Korea (Oct 2018)
- International Diabetes Federation World Diabetes Congress, Vancouver, Canada (2015)
- Epigenetics, Obesity and Metabolism, Hinxton, UK (2015)
- Invited Speaker at Division of Women's Health, Kings College, London, UK (2015)
- International Conference on Obesity and Weight Management, San Francisco, USA (2014)
- Annual Scientific Meeting of the Obesity Society, San Antonio, Texas, USA (2012)
- International Organization for Chemical Sciences in Development, Bellville, South Africa (2011)
- ZADEC collaborators meeting, Cape Town, South Africa (2007)
- European Association for the Study of Diabetes Annual Meeting, Amsterdam, Netherlands (2007)
- World Conference on Lung Health of the International Union Against Tuberculosis and Lung Disease, Cape Town, South Africa (2007)
- ZADEC collaborators meeting, Copenhagen, Denmark (2007)
- ZAMSTAR collaborators meeting, Lusaka, Zambia (2005)
- Keystone Symposia Tuberculosis: Integrating Host and Pathogen Biology, Whistler Resort, Canada (2005)
- International conference on the pathogenesis of Mycobacterial infections, Stockholm, Sweden (2002)
- IUBMB conference on the Biochemical and Molecular Basis of Disease, Rondebosch, South Africa (2001)
- International conference on the pathogenesis of Mycobacterial infections, Stockholm, Sweden (1999)
- International Congress on Hormonal Steroids, Quebec City, Canada (1998)

Selected national conferences

- Society of Endocrinology, Metabolism and Diabetes of South Africa (SEMDSA) conference (2010, 2014, 2017)
- Physiology Society of Southern Africa (PSSA) Conference (2009, 2011, 2014, 2015, 2019)
- South African Society of Biochemistry and Molecular Biology (SASBMB) conference, University of Stellenbosch, Stellenbosch (2005)
- Stellenbosch University Academic Day
- SAMRC Annual Research Day (2003, 2010, 2011)

Memberships of Professional Bodies

- Registered as a Medical Biological Scientist with the Health Professions Council of South Africa (MW0009776)
- Society of Endocrinology, Metabolism and Diabetes of South Africa (SEMDSA)
- South African Society of Biochemistry and Molecular Biology (SASBMB)