

# DR TARRYN WILLMER

## CURRICULUM VITAE

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### CONTACT

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 3 Belmont Way, Edgemean, 7441  
Cape Town, South Africa

### QUALIFICATIONS

**PhD 2015, Cell Biology**  
University of Cape Town

**MSc 2011, Biochemistry**  
Rhodes University

**BSc Hons 2009, Biochemistry**  
Rhodes University

**BSc 2008, Biochemistry and  
Microbiology**  
Rhodes University

### SKILLS

Pyrosequencing

Proteomics

Animal Handling

Mammalian Cell Culture

Molecular Cloning

Microscopy

Gene/protein expression

Molecular biologist and (epi)geneticist with a special interest in the role of DNA methylation in non-communicable diseases. Experienced and confident communicator and impassioned problem solver. Career aspirations include the translation and implementation of basic science into tangible human health benefits and finding novel strategies for the diagnosis and treatment of diseases.

### EMPLOYMENT

**Biomedical Research and Innovation Platform (BRIP), South African Medical Research Council (SAMRC)**

**Position:** Senior Scientist (August 2019 - present)  
Postdoctoral fellow (2017 - 2019)

**Research Areas:** Epigenetics, Obesity, Type 2 diabetes, Cardiovascular Disease, Cancer

**Responsivities:** Peer-reviewed publications, supervising students, innovation, grant writing, project management

**Department of Human Biology, University of Cape Town**

**Position:** Postdoctoral fellow (2016)

**Research Area:** Cancer, biomarkers, targeted therapies

**Responsivities:** Peer-reviewed publications, teaching, supervising students, grant writing, project management

### SHORT COURSES

**2022** Managers Development Course (Stellenbosch University)

**2018** Good Clinical Practice Beginners Course Level 2 (Accredited by SMLTSA)

**2014** Introductory course on Laboratory Animal Science, SAVC authorisation for animal handling (SAVC # AR15/14183)

Roche Gene Expression Workshop for MIQE Compliance

CRISPR workshop, University of Cape Town

**2013** Zeiss Advanced Confocal Microscopy Imagine Workshop for Live and Fixed Specimens

## FUNDING AND AWARDS

2021	NRF Thuthuka funding
2020	SAMRC- SHIP Pharmacogenomics in Precision Medicine funding (co-applicant with Dr Rabia Johnson)
2019	SAMRC baseline funding; NRF-DST Professional Development Programme (PDP) postdoctoral fellowship
2018	NRF-DST Professional Development Programme (PDP) postdoctoral fellowship
2017	NRF-DST Professional Development Programme (PDP) postdoctoral fellowship
2016:	NRF and Harry Crossley postdoctoral fellowships; Honours student won prizes for top Cell Biology honours student and best honours presentation
2015:	Struwig-Germeshuysen Cancer Research Trust Scholarship; DAAD-NRF Scholarship; Ernst & Ethel Erikson Trust Bursary; Marion Beatrice Waddel Bursary; First prize for oral presentation at UCT Department of Human Biology and Clinical Sciences Research Day
2014:	Ernst & Ethel Erikson Trust Bursary; Marion Beatrice Waddel Bursary; DAAD-NRF Joint Scholarship
2013:	Cancer Research Initiative of South Africa bursary; Marion Beatrice Waddel Bursary; DAAD-NRF Scholarship; NRF funding to attend Ziess Advanced Confocal Microscopy Imaging certificate for Live and Fixed Specimens
2012:	Cancer Research Initiative of South Africa bursary; Marion Beatrice Waddel Bursary; DAAD-NRF Scholarship
2011:	NRF scholarship; Medical Research Council bursary; Cancer Research Initiative of South Africa bursary; Director of Research scholarship; Graduate assistant bursary
2010:	NRF scholarship; Graduate assistant bursary
2009:	NRF scholarship
2008:	Clare Townsend bursary; Ackerman Trust bursary
2007:	Albert Wessels Trust bursary; Ackerman Trust bursary
2006:	Rhodes Merit Award (six matric distinctions), Deans merit list

## PEER REVIEWED PUBLICATIONS

- Willmer, T.**, Oosthuizen, A., Dias, S., Mendham, A. E., Goedecke, J. H and Pheiffer, C. (2022) A pilot investigation of genetic and epigenetic variation of FKBP5 and response to exercise intervention in African women with obesity. *Scientific Reports*, 12(1):11771. DOI: 10.1038/s41598-022-15678-6. (Impact factor 4.996)
- Willmer, T.**, Damerell, V., Smyly, S., Sims, D., du Toit, M., Ncube, S., Sinkala, M., Govender, D., Sturrock, E., Blackburn, J. M and Prince, S. (2021) Targeting the oncogenic TBX3:nucleolin complex to treat multiple sarcoma subtypes. *AJCR*, 11(11):5680-5700. (Impact factor 6,166).
- Viraragavan, A\*, **Willmer, T\***, Patel, O., Basson, A., Johnson, R., Pheiffer, C. (2021) Cafeteria diet induces global and Slc27a3-specific hypomethylation in male Wistar rats. *Adipocyte*, 10(1):108-118. DOI: 10.1080/21623945.2021.1886697. (Impact factor 3.533).
- Willmer, T.**, Dias, S., Louw, J., Goedecke, J., Pheiffer, C. (2020) DNA methylation of FKBP5 in South African women: associations with BMI and insulin resistance. *Clinical Epigenetics*, 12(141). DOI: 10.1186/s13148-020-00932-3 (Impact factor 6.551).
- Pheiffer, C., **Willmer, T.**, Dias, S., Abrahams, Y., Yan, L., Louw, Y., Goedecke, J. (2020) Global and Insulin Receptor DNA methylation in Abdominal and Gluteal Adipose Tissues of South African women: Variation according to Body Mass Index, Adipose Depot and Ethnicity. *Front. Genet.* DOI: 10.3389/fgene.2020.00967 (Impact factor 4.370).
- Willmer, T.**, Johnson, R., Louw, J., Pheiffer, C. (2018) Blood based DNA methylation biomarkers for type 2 diabetes: potential for clinical applications. *Front. Endocrinol*, 9(744). DOI: 10.3389/fendo.2018.00744. (Impact factor 5.555).
- Pheiffer, C., Dias, S., **Willmer, T.**, Louw, J. (2018) Altered microRNA expression during Impaired Glucose Tolerance and High-fat Diet Feeding. *Exp Clin Endocrinol Diabetes*, 126: 1-9. (Impact factor 2.426).
- Bleloch, J. S., Ballim, R. D., Kimani, S., Parkes, J., Panieri, E., **Willmer, T.**, and Prince, S. (2017) Managing sarcoma: where have we come from and where are we going? *Ther Adv Med Oncol*, 9(10), 637-659. DOI: 10.1177/1758834017728927. (Impact factor 7.03).
- Willmer, T.**, Cooper, A., Peres, J., Omar, R and Prince, S. (2017) The T-Box Transcription Factor 3 in Development and Cancer. *BioScience Trends*. DOI: 10.5582/bst.2017.01043. (Impact factor 2.400).
- Willmer, T.**, Hare, S., Peres, J. and Prince S. (2016) The T-box transcription factor TBX3 drives proliferation of chondrosarcoma cells by direct repression of the p21WAF1 cyclin-dependent kinase inhibitor. *Cell Division*, 11:6. DOI:10.1186/s13008-016-0019-0. (Impact factor 4.660).
- Willmer, T.**, Cooper, A., Govender, D. and Prince S. (2016) The T-box transcription factor 3 is a promising biomarker and a key regulator of the oncogenic phenotype of a diverse range of sarcoma subtypes. *Oncogenesis*. DOI: 10.1038/oncsis.2016.11. (Impact factor 7.485).
- Willmer, T.**, Peres, J., Mowla, S., Abrahams, A. and Prince P. (2015) The T-Box factor TBX3 is important in S-phase and is regulated by c-Myc and cyclin A-CDK2. *Cell Cycle*, 14:19. DOI:10.1080/15384101.2015.1080398. (Impact factor 3.952).
- Willmer, T.**, Contu, L., Blatch, G. L. and Edkins, A. L. (2013) Knockdown of Hop downregulates RhoC expression, and decreases pseudopodia formation and migration in cancer cell lines. *Cancer Letters*, 328 (2): 252-260. (Impact factor 8.679).

## SCIENTIFIC MEETINGS

### International

- Willmer, T.**, Oosthuizen, A., Dias, S., Mendham, A., Goedecke, J and Pheiffer, C. (2021) Investigating genetic and epigenetic variation in FKBP5 following exercise intervention in obese, insulin resistant South African women. Poster presentation at the EMBO|EMBL Symposium: Metabolism Meets Epigenetics (virtual conference).
- Viraragavan, A., **Willmer, T.**, Johnson, R., Basson, A and Pheiffer, C. (2021) A High Fat, High Sugar Diet Alters Molecular Patterns in the Adipose Tissue of Wistar Rats: An Epigenetic Study. Poster presentation at the International Conference of Dietetics (ICD), Cape Town, South Africa.
- Willmer, T.**, Oosthuizen, A., Dias, S., Goedecke, J and Pheiffer, C. (2021) Exercise Intervention induces hypermethylation of FKBP5 in Obese South African Women. Virtual e-poster presentation (with audio) at the 19th International Conference on Endocrinology (ICE).
- Willmer, T.**, Oosthuizen, A., Dias, S., Goedecke, J and Pheiffer, C. (2020) Impact of Exercise Intervention on DNA Methylation of FKBP5 in Obese, Insulin Resistant South African Women. Virtual e-poster presentation at the 18th Annual World Congress on Insulin Resistance, Diabetes, and cardiovascular Disease (WCIRDC), Los Angeles, California, USA.
- Willmer, T.**, Goedecke, J., Louw, J., Pheiffer, C. (2019) DNA methylation of FKBP5 in South African women: associations with BMI and insulin resistance. Oral presentation. ICGEB Workshop on Epigenetics of infectious and non-communicable diseases, Cape Town, South Africa.
- Myataza, A., **Willmer, T.**, Windvogel, S and Pheiffer, C. (2019) Characterization of high fat, high sugar diet-induced molecular changes and modulating effects by GRT in skeletal muscle of Wistar rats. Oral presentation. ICGEB Workshop on Epigenetics of infectious and non-communicable diseases, Cape Town, South Africa.
- Willmer, T.**, Goedecke, J., Louw, J., Pheiffer, C. (2018) Investigating epigenetic variation underlying obesity and insulin resistance in South African women. Poster presentation. 18TH International Congress of Endocrinology / 53rd SEMDSA Congress, Cape Town, South Africa.
- Pheiffer, C., **Willmer, T.**, Dias, S., Louw, J., Goedecke, J. (2018) Altered DNA methylation is associated with metabolic risk and ethnic variation in South African women. Poster presentation. Keystone Symposium on Molecular and Cellular Biology: Drivers of Type 2 Diabetes: From Genes to Environment, Seoul, South Korea.
- Willmer, T.**, Smyly, S., Smuts, D., Govender, D and Prince, S. (2017) Targeting the oncogenic TBX3 and its co-factor, nucleolin, in anti-cancer drug development. Oral presentation at the 49th Brazilian Congress of Pharmacology and Experimental Therapeutics, Ribeirão Preto, SP, Brazil.
- Willmer, T.**, Smyly, S., Smuts, D., Govender, D and Prince, S. (2017) Targeting the oncogenic TBX3 and its co-factors in anti-cancer drug development. Poster presentation at AACR International Conference on New Frontiers in Cancer Research conference, Cape Town, South Africa.
- Willmer, T.**, Prince, S., Smuts, D., Peres, J., Parkes, J. and Govender, D. (2016) The T-box transcription factor 3: a diagnostic biomarker and therapeutic target for a diverse range of sarcoma subtypes. Oral presentation at the Tata Memorial Centre Platinum Jubilee conference entitled "A Conference of New Ideas in Cancer - Challenging Dogmas", Mumbai, India.
- Willmer, T.**, Prince, S., Smuts, D., Peres, J., Parkes, J and Govender, D. (2015) The T-BOX transcription factor 3 is a promising biomarker and therapeutic target in a diverse range of sarcoma subtypes. AORTIC Roadmap to Cancer Control in Africa, Marrakech, Morocco.

**Willmer, T** and Prince, S. (2014) The T-box transcription factor, TBX3, promotes tumourigenesis in soft tissue and bone sarcomas: a possible therapeutic target. Poster presentation at European Association for Cancer Research (EACR) 23rd Biennial Congress, Munich, Germany.

### **National**

Viraragavan, A., **Willmer, T.**, Johnson, R., Basson, A and Pheiffer, C. (2020) The expression and methylation of Slc27a3 is altered in visceral adipose tissue of high fat, high sugar fed male Wistar rats. Oral presentation at the 10th annual BRIP Symposium, Cape Town, South Africa.

Damerell, V., **Willmer, T.**, du Toit, M., Swartz, S., Lennard, K., Mulder, N., Govender, D, Pepper, M. S and Prince, S. (2020) The role of oncogenic TBX3 in the transformation of mesenchymal stem cells into a subset of sarcomas. Poster presentation at the 10th annual BRIP Symposium, Cape Town, South Africa. Awarded best PhD poster presentation.

Myataza, A., **Willmer, T.**, Windvogel, S., Johnson, R and Pheiffer, C. (2020) Gender-differences in the development of obesity and metabolic disease. Poster presentation at the 10th annual BRIP Symposium, Cape Town, South Africa.

Oosthuizen, A., Pheiffer, C., Dias, S., Goedecke, J and **Willmer, T.** (2020) Impact of exercise intervention on DNA methylation of FKBP5 in obese, insulin resistant South African women. Poster presentation at the 10th annual BRIP Symposium, Cape Town, South Africa.

Viraragavan, A., **Willmer, T.**, Johnson, R., Basson A and Pheiffer, C. (2019) Molecular alterations in adipose depots of male and female Wistar rats fed a high fat, high sugar cafeteria diet. Oral presentation at 47th Conference of the Physiology Society of Southern Africa, East London, South Africa.

Myataza, A., **Willmer, T.**, Windvogel, S., Johnson, R and Pheiffer, C. (2019) Characterisation of cafeteria diet-induced molecular changes in skeletal muscle of male Wistar rats. Oral presentation at 47th Conference of the Physiology Society of Southern Africa, East London, South Africa.

Myataza, A., **Willmer, T.**, Windvogel, S. and Pheiffer, C. (2019) Characterisation of cafeteria diet-induced molecular changes in skeletal muscle of male Wistar rats. Oral presentation at 18th Biennial Congress of the Southern African Society for Human Genetics, Cape Town, South Africa.

Viraragavan, A., **Willmer, T.**, Johnson, R., Basson, A and Pheiffer, C. (2019) Visceral and subcutaneous adipose depots of male Wistar rats fed a high fat, high sugar diet display differential gene signatures. BRIP Symposium. Cape Town, South Africa.

Myataza, A., **Willmer, T.**, Windvogel, S., Johnson, R and Pheiffer, C. (2019) Characterisation of high fat, high sugar diet-induced molecular changes and modulating effects by Afriplex-GRT™ in skeletal muscle of Wistar rats. BRIP Symposium. Cape Town, South Africa.

**Willmer, T.**, Ncube, S., Smuts, D., Smiley, S., Prince, S. (2018). The c-Myc/TBX3/nucleolin/Hsc70 signalling axis in oncogenesis. Oral presentation at SASBMB- FASBMB Conference, North-West University, Potchefstroom, South Africa.

**Willmer, T.**, Smuts, D., Govender, D. and Prince, S. (2016) Targeting the Oncogenic Transcription Factor TBX3 and its co-factors in Anti-Cancer Drug Development. Oral presentation at SASBMB, East London, South Africa.

**Willmer, T.** and Prince S. (2015) The T-box transcription factor 3 is a promising biomarker and therapeutic target in a diverse range of sarcoma subtypes. Oral presentation at UCT Human Biology and Clinical Laboratory Science Research Day, Cape Town, South Africa. Award for best oral presentation.

**Willmer, T.** and Prince S. (2015) The T-box transcription factor 3 is a promising biomarker and therapeutic target in a diverse range of sarcoma subtypes. Oral presentation at Pathology Research and Development Congress (PathRed), Johannesburg, South Africa.

**Willmer, T.** and Prince S. (2015) Overexpression of the T-box transcription factor, TBX3, as an early marker of sarcomas. Oral presentation at CANSA research in action conference, Stellenbosch, South Africa.

**Willmer, T.,** Blatch, G. L. and Edkins, A. L. (2012) The role of Hsp90/Hsp70 organising protein (Hop) in the proliferation, survival and invasion of cancer cells. Oral presentation at SASBMB-FASEB 2012

Burger, A., **Willmer, T.,** Whiteley, C. and Boshoff, A (2010) Escherichia coli RNA degradosome: The analysis of heat shock proteins and enolase. SASBMB - Free Your Energy. Bloemfontein.

## **POSTGRADUATE STUDENTS**

### **Current:**

Miss Ayesha Shaik. Investigating DNA methylation of metabolic and inflammatory genes with therapeutic potential for obesity: A cohort study in South African women. MSc in Medical Physiology, Stellenbosch University

Miss Mia Lombard. Investigating DNA methylation signatures with diagnostic and therapeutic potential for obesity using a targeted pyrosequencing approach. BSc Hons in Medical Physiology, Stellenbosch University

Miss Anri Kotze. Maternal methyl donor nutrients and fetal epigenetic programming of breast cancer risk in female Wistar rat offspring. MSc in Medical Physiology, Stellenbosch University

### **Graduated:**

Miss Shannon Smyly. Targeting the TBX3:Nucleolin complex as an Anti-Cancer Therapy for Liposarcoma. BMedSc(Honours), University of Cape Town (2016). (Degree with distinction).

Miss Amberly Oosthuizen. Impact of exercise intervention on DNA methylation of FKBP5 in obese, insulin resistant South African women. BSc Hons in Medical Physiology, Stellenbosch University (2020). (Degree with distinction).

Miss Amsha Viraragavan. DNA methylation and modulating effects by an aspalathin-enriched rooibos extract in the adipose tissue of obese Wistar rats. PhD Biochemistry, Faculty of Science and Agriculture, University of Zululand (July 2021).

Miss Asive Mayataza. Epigenetic regulation and modulating effects by an aspalathin-enriched Rooibos extract in skeletal muscle of obese, insulin resistant Wistar rats. PhD in Medical Physiology, Stellenbosch University (December 2021).

## **ENTRUSTED ACTIVITIES**

### **Senior Extraordinary Lecturer**

Division of Medical Physiology, Department of Biomedical Sciences, Stellenbosch University

### **Journal review**

Journal of Cellular Biochemistry

Cellular Physiology and Biochemistry

Experimental Cell Research

Frontiers in Clinical Endocrinology

Molecular Biology Reports

Journal of Molecular Medicine

### **Examiner**

International PhD examiner

BSc honours programme, Departments of Human Biology, Faculty of Health Sciences, University of Cape Town.

BSc honours programme, Department of Medical Physiology, Faculty of Medicine, Stellenbosch

University

### **Teaching**

Cell Biology Honours programme, University of Cape Town

Medical physiology Honours programme, Stellenbosch University

### **Tutoring**

2nd year Physiology, University of Cape Town

1st year MBCHB histology

## **MEMBERSHIPS OF PROFESSIONAL BODIES**

South African Veterinary Council (SAVC # AR15/14183)

South African Society of Biochemistry and Molecular Biology (SASBMB)

European Association of Cancer Research

American Association of Cancer Research

## REFERENCES

### **Prof. Sharon Prince**

Head of Division of Cell Biology, Department of Human Biology, University of Cape Town

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### **Dr Carmen Pheiffer**

Senior Specialist Scientist, Biomedical Research and Innovation Platform, SAMRC

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