

Curriculum Vitae

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Senior Researcher, Department of Biomedical Sciences
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Contact Information

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Education

2014	PhD in Medical Physiology	University of Stellenbosch
2008	MSc in Medical Physiology	University of Stellenbosch
2008	Honours in Psychology	University of South Africa
2002	BSc in Psychology	University of South Africa
2023	Accounting Technician Level 3	SAICA

Employment History

Position	Researcher
Organization	University of Stellenbosch
Appointed From / To	January 2008 - current
Position	Research Assistant
Organization	University of Stellenbosch
Appointed From / To	March 2005 – January 2008
Position	Administration Clerk
Organization	Virgin Active
Appointed From / To	January 1995 – January 2005

Research

Scientific Domain	Health and Medical Sciences
Primary Research Field	Medical sciences: Basic
Secondary Research Field	Epidemiology, incl. burden of disease
Fields of Specialization	Cardiovascular research

Post-Graduate Teaching / Supervision

Sam van Rensburg (2011), Honours – Medical Physiology: “Oxidative and nitroxidative stress in TNF- α and hypoxia stimulated endothelial cells”.

Supervisor

Charlize Nieuwenhuizen (2013), Honours - Medical Physiology: “Establishing a method for determining levels of nitric oxide, reactive oxygen species and cell viability in Cardiac Microvascular Endothelial Cells, using fluorescent probes and a microplate reader”.

Supervisor

Tope Ogundipe (2014), Honours - Medical Physiology (Cum-Laude): “The effects of ART and obesity on vascular endothelial function”. Supervisor

Dawn Mhlangu (2016), Honours - Medical Physiology: “The effects of the first- and second-line antiretroviral drug treatment (ART) therapy on the endothelial function of cultured aortic endothelial cells: An observational study”. Supervisor

Frans Everson (2014 – 2016), MSc - Medical Physiology (Cum Laude): “Investigating the Cardiovascular Effects of Antiretroviral Drugs in a Lean and High Fat/Sucrose Diet Rat Model of Obesity: An In Vivo and Ex Vivo Approach”. Supervisor

Sana Charania (2015 – 2016), MSc – Medical Physiology (Cum Laude): “Investigating the effects of first line and second line antiretroviral drugs on HIV exposed endothelial function - A clinical study, supported by a mechanistic in-vitro approach”. Co-supervisor

Clara Marincowitz (2017 – 2018), MSc – Medical Physiology (Cum Laude): “The effects of HIV-1 proteins and antiretroviral therapy on aortic endothelial cells. An in vitro investigation emulating the South African context”. Supervisor

Jance Peterson (2019), Honours – Medical Physiology (Cum Laude): “The Effects of HIV & Antiretroviral Therapy on Vascular Function – A pilot study”. Supervisor

Dintle Molopi (2019-2022), MSc – Medical Physiology (2022): “The vascular and endothelial effects HIV, antiretroviral therapy and Rooibos- functional effects and mechanism “. Supervisor

Charnay Cunningham (2019-2025), PhD – Medical Physiology (2025): “Impact of charged particle irradiation on tumor angiogenesis”. Supervisor

Thesis examination:

Internal:

Ms DA Millar (MSc) (17078334-2012)

Ms E Imperial (MSc): Effect of Aspalathus linearis supplementation, during anti-retroviral treatment, on the heart and aortas of male Wistar rats and the effects of drinking Rooibos on the cardiovascular profile of patients on ART treatment.

Ms P Sithole (MSc): Investigating the efficacy and underlying mechanism of cardioprotection afforded by Rooibos (*Aspalathus linearis*) in Angiotensin-II induced cardiomyocyte hypertrophy & apoptosis.

Ms C Payne (MSc): The involvement of disrupted mitochondrial pathways in pulmonary arterial hypertension as a tuberculosis sequela in a South African cohort.

Ms I Willemse (MSc): *Aspalathus linearis* as a possible SGLT2-inhibitor: Investigating the antihypertensive effects of Green Rooibos Extracts.

Ms Yashti Ramsunder (MSc): An in vivo model investigating the effect of stress on the mammalian blood-testis barrier.

Ms Cassidy O'Brien (MSc): Is stress a leading cause of vascular disease? A mechanistic insight into the sex-specific links between chronic stress and endothelial (dys)function.

Ms Gemma Krausey (MSc): An investigation into the effects of Selective Serotonin Reuptake Inhibitor (SSRI) antidepressants on sperm parameters - an in vitro study.

Ms Thato Kgatla (PhD): Delineating the novel effects of *Aspalathus linearis* (Rooibos) on mitochondrial regulation in an in vitro model of angiotensin-II induced hypertrophy and apoptosis.

External:

Ms Siphesihle Mkhize (MSc) (UKZN): Investigating the effects of a diamagnetic vanadium-2-phenolate-1H-benzimidazole complex on cerebral atherosclerosis and associated risk of ischemic stroke in STZ-induced diabetic male Sprague Dawley rats.

Ms Nompilo Mthembu (MSc) (UKZN): Investigating the effects of dioxidovanadium(V) on platelet induced endothelial dysfunction in STZ-induced diabetic male Sprague Dawley rats.

Completed and ongoing projects:

Completed:

The cardiovascular effects of antiretroviral drugs in lean and high-fat diet, insulin-resistant rats. The effects of ART and obesity on cardiovascular endothelial function.

South African ART drug combinations: Cardiovascular effects in insulin resistant, obese rats.

Completed:

The vascular and endothelial effect of antiretroviral therapy (*ex vivo* study) – functional effects and mechanisms.

Completed:

The effects of HIV-1 proteins and antiretroviral therapy on aortic endothelial cells. An in vitro investigation emulating the South African context.

Completed:

The vascular and endothelial effects HIV, antiretroviral therapy, and Rooibos- functional effects and mechanism.

Impact of charged particle irradiation on tumor angiogenesis.

Current / Ongoing:

Joined MitoSAKen study in 2022 investigating Altered mitochondrial function and HIV-associated cardiometabolic disease in populations from South Africa and Kenya (MITO-SAKen).

Chapter in book:

“Endothelial Dysfunction: Risk Factors, Role in Cardiovascular Diseases and Therapeutic Approaches. Title of chapter: Attenuation of eNOS-NO biosynthesis, up-regulation of antioxidant proteins and differential protein regulation in TNF-alpha-treated cardiac endothelial cells: Early signs of endothelial dysfunction (2014)”. ISSN/ISBN Number: 978-1-63321-203-9. First author

Peer Reviewed Publications:

Baseline predictors of vascular and endothelial outcomes at 18-month follow-up in people living with HIV: Results from the EndoAfrica study. Strijdom, H, Goswami, N. De Boever, P, Webster, I, **Genis, A**, Everson, F. Atherosclerosis. 2023; 379: S154. 91st European Atherosclerosis Society Congress, Mannheim, Germany, 21-24 May 2023.

Recombinant Endostatin as a Potential Radiosensitizer in the Treatment of Non-Small Cell Lung Cancer. C Cunningham, J Bolcaen, A Bisio, **A Genis**, H Strijdom, C Vandevoorde. Pharmaceuticals 16 (2022), 219

Long-chain free fatty acids inhibit ischaemic preconditioning of the isolated rat heart. A Lochner, S Genade, **A Genis**, E Marais, R Salie. Molecular and Cellular Biochemistry 473 (1), 111-132 (2020).

Treatment with a fixed dose combination antiretroviral therapy drug containing tenofovir, emtricitabine and efavirenz is associated with cardioprotection in high calorie diet-induced obese rats. Everson, F., **Genis, A.**, Ogundipe, T., De Boever, P., Goswami, N., Lochner, A., Blackhurst, D. and Strijdom, H. PloS one, 13(12), p.e0208537 (2018).

Vascular endothelial dysfunction in the wake of HIV and ART. Marincowitz, C., **Genis, A.**, Goswami, N., De Boever, P., Nawrot, T.S. and Strijdom, H. The FEBS Journal (2018).

Endothelial dysfunction in aortic and cardiac microvascular endothelial cells: The heterogeneous response to the pro-inflammatory cytokine, tumor necrosis factor- α (TNF- α). M Mthethwa, **A Genis**, C Westcott, H Strijdom. Atherosclerosis 275, e125 (2018).

Investigating endothelial dysfunction as a pathophysiological consequence of HIV-infection and anti-retroviral treatment. **A Genis**, TP Ogundipe, C Marincowitz, H Strijdom. Cardiovascular Research 114, S43-S43 (2018).

A histomorphometric study on the effects of antiretroviral therapy (ART) combined with a high-calorie diet (HCD) on aortic perivascular adipose tissue (PVAT). S. Nel, H. Strijdom, **A. Genis**, F. Everson, R. Van Wijk and S.H. Kotzé. Acta Histochemica; Volume 119, Issue 5, June 2017, Pages 555-562 (2017).

Investigating the cardiovascular effects of antiretroviral drugs in a lean and high fat/sucrose diet rat model of obesity. **Genis, A**; Everson, FP; Ogundipe, T; Grandjean, T; De Boever, P; Goswami, N and Strijdom, H. Cardiovascular Research; Volume: 111, Pages: S74-S75, Supplement: 1 (2016).

Cardiometabolic and vascular effects of treatment with a fixed-dose combination anti-retroviral drug containing nucleoside and non-nucleoside reverse transcriptase inhibitors (NRTI's and NNRTI's) in adult rats. Strijdom, H; Goswami, N; De Boever, P; Westcott, C; Ogundipe, T; Everson, F and **Genis, A**. Atherosclerosis; Volume: 252, Pages: E166- E166 (2016).

Obesity and insulin resistance are not associated with endothelial dysfunction in rat aortas. H Strijdom, D Loubser, **A Genis**, C Westcott, M Mthethwa, S Smit. Cardiovascular Research 103 (2014).

Short term fenofibrate treatment increases nitric oxide production in cardiac endothelial cells through a nitric oxide synthase-independent mechanism. C Westcott, **A Genis**, M Mthethwa, H Strijdom. Cardiovascular Research 103 (2014).

DPP-4 inhibition is cardioprotective and restores pancreatic function in obese, insulin resistant rats. Huisamen, B; **Genis, A**; Marais, E and Strijdom, H. Cardiovascular Research. Volume: 103, Supplement 1 (2014).

Endothelial dysfunction: the early predictor of atherosclerosis. Mudau M, **Genis A**, Lochner A, Strijdom H. Cardiovasc J Afr: 23(4):222-31 (2012).

Pre-treatment with a DPP-4 inhibitor is infarct sparing in hearts from obese, pre-diabetic rats. Huisamen B, **Genis A**, Marais E, Lochner AC. Cardiovasc Drugs Ther; Feb;25(1):13-20 (2011).

Dexamethasone-induced cardioprotection: a role for the phosphatase MKP-1? Fan WJ, Genade S, **Genis A**, Huisamen B, Lochner A. Life Sci: 5;84(23-24):838-46 (2009).

Melatonin receptor-mediated protection against myocardial ischaemia/reperfusion injury: role of its anti-adrenergic actions. Genade S, **Genis A**, Ytrehus K, Huisamen B, Lochner A. Journal of

Pineal Research. 45: 449–458 (2008).

Postconditioning the isolated working rat heart. Van Vuuren D, **Genis A**, Genade S, Lochner A. Cardiovasc Drugs Ther; 22: 391(2008).

A role for the RISK pathway and K-ATP channels in pre- and post-conditioning induced by levosimendan in the isolated guinea pig heart. Du Toit EF, **Genis A**, Opie LH, Pollesello P, Lochner A. Br J Pharmacol.: 154:41-50 (2008).

Insulin paradoxically protects the rat heart during low-flow ischaemia via cAMP, but not PI3K, while blunting pathological signals from the β -AR and PKA. J Lopes, **A Genis**, A Lochner, B Huisamen. Cardiovascular Journal of Africa 11 (con 1) (2008).

Levosimendan, a new antifailure inodilator, has cardioprotective properties mediated by mitochondrial K-ATP channels. EF Du Toit, **A Genis**, P Pollesello. J Mol Cell Cardiol (2007).

Pharmacological pre-and post-conditioning: A role for levosimendan in the isolated guinea pig heart. EF du Toit, **A Genis**, S Genade, LH Opie, P Pollesello, A Lochner. Journal of Molecular and Cellular Cardiology 42, S176-S176 (2007).

Conferences:

International Conferences

Refereed:

Frontiers in Cardiovascular Biology, Amsterdam, Netherlands (2024). The effects of HIV-1-proteins and antiretroviral therapy on aortic endothelial cells (AECs). A mechanistic in vitro approach. Cardiovascular Research, Volume 120, Issue suppl_1, 1 May 2024, <https://doi.org/10.1093/cvr/cvae088.214>.

Frontiers in Cardiovascular Biology, Vienna, Austria (2018). Investigating endothelial dysfunction as a pathophysiological consequence of HIV-infection and anti-retroviral treatment. Cardiovascular Research, Volume 114, Issue suppl_1, 1 April 2018, Pages S43, <https://doi.org/10.1093/cvr/cvy060.124>.

Frontiers in Cardiovascular Biology, Florence, Italy (2016). “Investigating the cardiovascular effects of antiretroviral drugs in a lean and high fat/sucrose diet rat model of obesity”. Cardiovascular Research, Volume: 111, Supplement: 1 (S74-S75), Abstract: 418.

79th European Atherosclerosis Society Congress, Gothenburg, Sweden (2011). “Effects of low-dose TNF- α administration on oxidative/nitrosative stress: the Akt/eNOS/NO pathway and viability in cardiac endothelial cells”. Atherosclerosis Supplements 2011; 12(1): 68.

20th World Congress of the ISHR 2010. Kyoto, Japan (2010). “Protein phosphatase 2A (PP2A) in myocardial ischaemia/reperfusion injury”. JMCC, supplements, S163, P-3-28-2, S163.

20th World Congress of the ISHR 2010. Kyoto, Japan (2010). “Tumor necrosis factor (TNF)- α

induces endothelial dysfunction (ED) in cultured cardiac microvascular Endothelial Cells (CMECs), by downregulation of the PKB/Akt-eNOS signaling pathway". JMCC, supplements, S94, P-2-21-3.

Non-refereed:

IUPS Conference, Birmingham, UK (2013). "Signalling responses in cardiac endothelial cells, following treatment with high concentrations of TNF-alpha, with or without co-treatment with Oleanolic Acid". Proc 37th IUPS, PCD382. First author.

National Conferences

Refereed:

SA Heart (2009). "A novel model of Endothelial Dysfunction (ED) in cultured cardiac microvascular endothelial cells". SA Heart 2009; 6(4): 264. First author.

PSSA (2010). "Tumor necrosis factor (TNF)- α induces endothelial dysfunction (ED) in cultured cardiac microvascular endothelial Cells (CMECs) by downregulation of the PKB/Akt- eNOS signaling pathway". J Mol Cell Cardiol 2010; 48 (5, S1): S94. First author.

SA Heart (2011). "Microvascular endothelial cell responses to inflammatory stimulation". SA Heart 2011; 8(4): 257. Co-author.

PSSA (2012). "Evidence of pro-survival responses in TNF- α stimulated microvascular endothelial cells". Scientific Research and Essays April 2012; 7: 45-46. Co-author.

PSSA (2012). "Tumor necrosis factor (TNF)- α : towards a model of endothelial dysfunction". Scientific Research and Essays April 2012; 7: 40. Co-author.

SA Heart (2012). "Proteomic characterization of cardiac endothelial cell responses to TNF-alpha, hypoxia and asymmetric dimethylarginine (ADMA) stimulation". SA Heart 2012; 9(3): 194. Co-author.

SA Heart (2017). "Fenofibrate protects endothelial cells against the harmful effects of TNF-alpha". SA Heart, 14(1):22-34. Co-author.

Current h-index:

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Other Contributions to Science:

Invited Commentary by the International Atherosclerosis Society:

"When traditional and non-traditional cardiovascular risk factors target the vascular endothelium: A double blow to the burden of disease in South Africa (2013)". <http://www.athero.org/commentaries/comm1135.asp>.

Co-author, research & intellectual input.

Awards or achievements:

Award for “best poster” at Physiological Society of South Africa (2012):

A complete profile of the cardiac microvascular endothelial cell proteome, following a 24-hour TNF- α treatment.

A. Genis, S. Smit, C. Westcott, M. Mudau, H. Strijdom.

Award for “best poster” at SA Heart (2009):

A Novel Model of Endothelial Dysfunction (ED) in Cultured Cardiac Microvascular Endothelial Cells (CMECs).

A Genis, E Mudau, A Lochner & H Strijdom.