2013 Issue 1

PSSA News

Newsletter of the Physiology Society of Southern Africa (PSSA)

Focus on the PSSA 2012 Congress

This edition of the newsletter focuses on the 40th congress of the PSSA held at Stellenbosch University in September 2012.
A novelty at the conference was the introduction of different competition categories. There was a separate Honours stream, and the winners of this category were then automatically also part of the overall Wyndham competition. MSc and PhD students competed in a preliminary Wyndham competition round and then went onto a final.

Following the end of term of office of Dr Constance Sewani-Rusike (Walter Sisulu University) and Dr Benjamin Loos (Stellenbosch University) the AGM saw the election of Dr Chivandi (University of the Witwatersrand) and Dr John Lopes (Stellenbosch University) onto the PSSA council. As the congress convenor, Prof Leon Hay (University of Limpopo Medunsa campus) came onto the council as vice president.

May I take this opportunity to acknowledge and thank Dr Ben Loos for his dedication and enthusiasm as editor of the PSSA newsletter over the past two years. *Kennedy Erlwanger*

Prof van Papendorp receiving a certificate from the president of the PSSA.

Honorary Fellowship

Prof Dirk van Papendorp (HOD Physiology, Faculty of Health Science, University of Pretoria) was awarded honorary fellowship of the PSSA.

"Honorary Fellowship of the Society may be conferred, by decision of the Council, upon persons who have, by virtue of their standing and/or scientific efforts, contributed substantially, over many years, to the Society, or who have provided meritorious service to the community in pursuit of objectives in line with those of the Society. Honorary fellowship is conferred for life"

Winner of established researcher prize: Dr Lacerda

Brief personal history: Born in Kenya, schooled in Nairobi and Mombasa then parents moved to Uganda, Congo, the UK and then SA, so I had a very varied education style, encompassing 15 different schools! I completed Matric in SA in Port Elizabeth and went on to study as a Medical Technologist. Many years later I was employed as a research technician at the Hatter Institute for Cardiovascular Research, UCT and there I completed my MSc in Medicine followed by my PhD in Medicine in 2010.

Dr Lacerda

My research interests:

My primary interest is cardiovascular research – in particular on how we can minimise the damage done to this muscle after an acute myocardial infarction. Unfortunately, when the blood flow is restored after an AMI, the heart is exposed to an influx of reactive oxygen species which leads to major damage to the cells.

My studies, using transgenic mice and the isolated heart, have involved exploring whether TNF alpha, an endogenously produced cytokine, could be used as a postconditioning mimetic and delineating the mechanism by which a low concentration of TNF alpha confers protection against reperfusion injury. In conjunction with these studies I have been investigating the cellular origin of the protective concentration of TNFα in the heart, using the isolated Langendorff retrograde perfusion model for the isolated heart. We hypothesised that the cardiomyocyte itself may well be the cell responsible for producing this low cardioprotective concentration of TNF alpha and we went on to create mouse in which TNF alpha was knocked out of the cardiomyocyte only and together with a macrophage/neutrophil TNF knock out mouse, we aimed to prove or disprove our hypothesis. This was the work presented at the PSSA conference in 2012, and at

that stage our results were suggestive that the cardiomyocyte was indeed the cell responsible for the production of the cardioprotective concentration of TNF alpha.

I have since obtained a post in the Dept of Physiological Sciences at Stellenbosch University where I feel I can pass on my years of experience with various techniques to the students who are interested in physiology and hopefully help build up a passion for basic science in many of these very bright students! The study to conclusively prove whether the cardiomyocyte is the responsible cell, continues at the Hatter Institute for Cardiovascular Research under the leader of the cardioprotection group, Dr Sandrine Lecour.

Johnny van Der Walt Poster competition runner up: Dirk J. Loubser Stellenbosch University

I see myself as a person that is always driven and in search of change and new challenges. It is this drive that made me decide to further my studies in Medical Physiology at Tygerberg campus after finishing my BSc degree at Stellenbosch University in 2010. My honers project in 2011, under supervision of Dr. Ruduwaan Salie and Prof. Amanda Lochner, focused on investigating the importance of the washout period in β2-preconditioned hearts. Our results showed significant activation of kinases known to be associated with cardioprotection to occur during the washout period.

Dirk Loubser

I am currently busy with my MSc at the same division under supervision of Prof. Hans Strijdom. My project focuses on new techniques to measure Nitric Oxide (NO) in cell cultures in a quantitative manner, as well as studying the functional effects of NO release by means of an aortic ring contraction/relaxation model of which the setup and standardization also forms part of my project.

Although my future is still uncertain, I am always ready to learn and am still in pursuit of new challenges to allow me to contribute to the scientific community.

Wyndham Competition Winner: Gina Leisching (Stellenbosch University)

My field of interest has always been molecular biology and the pathological dysregulation of intracellular signalling pathways which result in array of human diseases, such as cancer. Improvement of human health, particularly in South Africa has been the main driving force for the continuation of my research career, and this was highlighted by my Ph.D work, which was in part, presented at the PSSA on 2012. Since chemotherapy treatment often leads to long lasting and damaging side-effects, I was determined to find away to utilise a low, non-toxic concentration of cisplatin (chemotherapy drug) which was not harmful to normal, non-cancerous cells. The reason for this is due to the fact that the side-effects are experienced as a result of chemotherapy killing normal healthy cells in addition to the cancerous ones. I improved the toxicity of this low-concentration of cisplatin and cancer selective cell death by inhibiting autophagy (a process observed to confer resistance to chemotherapy) as pre-treatment to cisplatin in an *in vitro* model of cervical cancer. In the next five years I hope to still be positively contributing to the improvement of human diseases which plague South Africa.

Wyndham Competition runner up: Miss Nireshni Chellan

Having successfully completed two postgraduate degrees at Stellenbosch University (BSc Hons and MSc Medical Science) after my undergraduate BSc degree at the University of Kwa-Zulu Natal, the progression onto a PhD was unquestioned. Under the supervision of Dr Christo Muller (Medical Research Council) and Prof Hans Strijdom (Stellenbosch University) I find myself in an exciting niche within which I can investigate potential protection of pancreatic β-cells against damage associated with type II diabetes (T2D). Needless to say, that with the scourge of T2D both locally and abroad, such research is very pertinent.

This project is addressed with a multipronged approach, which includes establishing *in vitro, in vivo* and *ex vivo* models in which to assess potential therapeutics. Data that I presented at the 2012 PSSA Conference in Stellenbosch was generated while establishing an *in vitro* gluco-toxic model in RIN-5F pancreatic β-cells (figure 1). Flow cytometric analysis revealed that acute exposure of RIN-5F β-cells to hyperglycemia (i.e. 35 mM glucose) for short periods of time (15 - 60 minutes) had no detectable effect on cell function or survival. Chronic exposure to hyperglycemia for more than 24 hours impaired cell function. I have progressed onto lipo-toxic as well as cytokine-induced models of β-cell stress associated with T2D, as well as *in vivo* work in Wistar rats. Within the next five years I fervently anticipate to have made significant in-roads in terms of therapeutic targets in β-cell protection. Furthermore, I hope to translate my research into tangible outputs for the forward progression of pancreatic β-cell research. "*Learn from yesterday, live for today, hope for tomorrow. The important thing is not to stop questioning*." **Albert Einstein**

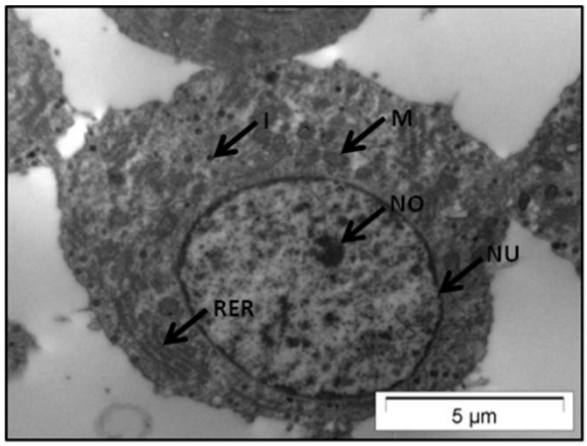


Figure 1. Electron micrograph of a RIN-5F β-cell.
I – Insulin granule; M – Mitochondria; NO – Nucleolus; NU – Nucleus; RER – Rough endoplasmic reticulum.

Wyndham Competiton Runner up: Britta Kleeman

I am a PhD student in the Redox laboratory of Dr Lester Davids at the University of Cape Town, Faculty of Health Sciences. My project investigates St John's Wort photomedicine for melanoma. Photodynamic therapy (PDT) is a photomedicine for cancer that uses the synergistic action of a photosensitizer, light and oxygen to generate reactive oxygen species. This in turn destroys the tumour through oxidative stress. The importance of this therapy lies in the tumour specificity of the photosensitizer, leaving the healthy body intact, a clear advantage over conventional chemo- and radiation therapy.

One such potent photosensitizer is hypericin, an extract from St John's Wort *(Hypericum perforatum).* Its efficacy in killing melanoma cells has not been established. We showed that hypericin-PDT is effective in killing melanoma cells by inducing a range of cell death modes, from apoptosis to necrosis. Furthermore, fluorescent confocal microscopy studies revealed that hypericin localizes to lysosomes in the melanoma cells investigated. Overall, hypericin-PDT has potential as an adjunctive therapy for melanoma.

I am currently writing up my PhD. Once I submit I am planning to spend some time with my family in my home country Namibia and travel abroad. I have however developed a deep love for Cape Town and its people so it might be difficult to leave this beautiful place. In the next few years I see myself communicating science to the public, especially children, as I believe we need to sow the seeds of change into the creators of tomorrow. I intend to combine my different passions and am excited to see how my life will unfold. Watch this space ☺

Johnny van der Walt Poster competition

The Johnny van der Walt Poster competition winners were:

1st – C. Springhorn* (Stellenbosch University)

2nd – KMSE Reyskens* (Stellenbosch University)

3rd – DJ Loubser (Stellenbosch University, Tygerberg campus)

3rd – R. Benecke *(Stellenbosch University)

*Will be featured in the next edition of the newsletter

Andrew Raymond: Wyndham competition

I am currently a PhD student at the University of Witwatersrand in the Cardiovascular Pathophysiology and Genomics Research Unit (CPGRU).

My current field of research is that of telomere length with a specific focus on its impact on cardiovascular disease. Telomeres are specialised structures that cap the ends of chromosomes, which are essential in maintaining chromosomal stability and replicative potential. There is an increasing body of evidence linking telomere length to both cardiovascular disease and associated risk factors for the development of cardiovascular disease. In order to investigate the relationship between telomere length and heart failure, various animal models of heart failure have been employed by our research group (CPGRU). One of these models was that of chronic ethanol consumption and it was data arising from this project that was presented at PSSA 2012. The pertinent findings emanating from this study is the importance of apoptosis in the cardiac remodelling seen in an alcoholic cardiomyopathy. This finding is an important stepping stone in the elucidation of the pathophysiological mechanisms at play in an alcoholic cardiomyopathy.

Within the course of 2013 I hope to publish data that has arisen during the course of my PhD and submit my thesis.

Some random Pics

Team members from Stellenbosch University (main campus)

Dr Benjamin Loos and Rohan Benecke (Runner up Johnny van der Walt Poster competition)

Prof Dirk van Papendorp and Dr Theo Nell

Grazelda Simon & Dr Lacerda

Plenary speakers: Prof Anne Jonassen (Bergen University Norway) & Prof Sandrine Lecour (Hatter Institute, Cape Town)

Prof M.F. Essop With J VD Walt poster winners: Clare Springhorn & Kathleen Reyskens

Witsies settling down to dinner: Andrew, LeRoux, Janine, Bryan and Prof Kamerman (Plenary Speaker)

Dr Ambrose Namugowa: Gangnam stvle

Busisani, Eliton, Eugene (WSU) & Lawrence

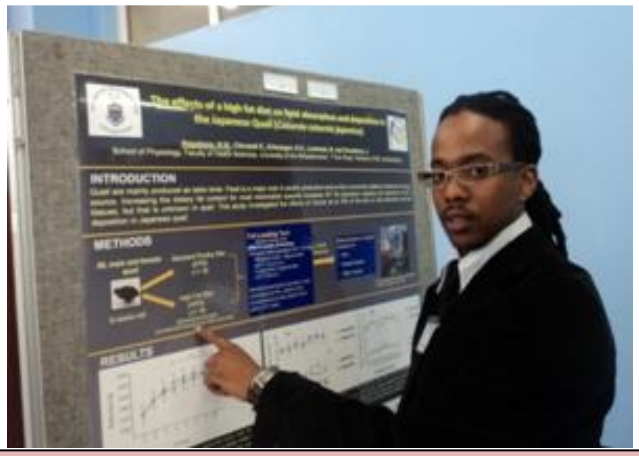
Plenary Speaker: Prof Jacob Mufunda receiving a token of appreciation from Dr Theo Nell and Prof Anna-Mart Engelbrecht (Congress convener)

Delegates in one of the venues

Colleagues from WSU, Wits & UJ celebrating Owen Karimanzira's special mention

Let me show you how it is done!

Mr Mhlengi Magubane at his poster



For your Diary: The 41st Congress & meeting of the PSSA

Dates: 15 September to 18 September 2013

Venue: Roodevallei Country Lodge, Kameeldrift East, Pretoria.

Congress convenor: Prof Leon Hay
Email: Leon.Hay@ul.ac.za

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