



PSSA NEWSLETTER

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From the President's desk

It is a daunting and yet exciting venture to take up the presidency of an important and prestigious organization such as the PSSA. I wish to express my gratitude to my fellow physiologists who entrusted me with this position – I will strive my utmost to sustain and further uplift the workings, initiatives and profile of the PSSA. It is important to remember that the organization has a solid history, being led by many able and dynamic predecessors. We remain grateful to all those who played pioneering roles to sustain the organization. **I also wish to thank the outgoing president - Prof. Kennedy Erlwanger - for the sterling work done over the last few years and I am sure he will continue to provide us with his insight and experience gained in this position.**

I have an excellent supporting team that makes up the current PSSA council: Dr. Ben Loos (secretary/treasurer), Prof. Mahendra Channa (PSSA 2014 Congress organizer), Prof. Saartjie Roux, Dr. Saramarie Eagleton, Dr. Eliton Chivandi and Dr. John Lopes. I wish to assure you that council is already hard at work (behind the scenes) – many thanks to all the good efforts put in by my team members. As one of my first tasks, I decided to arrange a strategic session with fellow council members that were recently held in beautiful town of Stellenbosch. This was quite a historic occasion since – as far as we are aware – this was the first time a strategic planning session was ever organized by a PSSA council. Although we only had the best part of a half-a-day, this provided us with a unique opportunity to get to know each other quite well and to also **draft eight strategic initiatives for the PSSA that will guide the way forward**



for the next three years (2014-2016). These aim to a) improve membership experience, b) strengthen African links, c) establish broader representation within the southern African region, d) increase PSSA's visibility, e) strengthen the financial base, f) establish the annual PSSA congress as a premier meeting on the yearly calendar, g) enhance links to industry, and h) grow the next generation of physiologists.

A key initiative for this term will be to enhance the PSSA's links with other organizations such as the African Association of Physiological Sciences and the International Union of Physiological Sciences. This should promote the PSSA's visibility on a bigger stage and also facilitate increased interaction with fellow physiologists across the globe. We are also in the process of updating the current PSSA website in order to deliver a far-more engaging and interactive experience for users – a website specialist is currently in the process of designing this – watch this space! In addition, considerable effort is being made to ensure that the annual

PSSA 2014 Congress to be held in Durban (September 2014) will be a great success. However, to launch and pursue such initiatives will require additional financial resources and the PSSA Council has several plans to take up this challenge. In light of our strategic initiatives and since membership fees have not been adjusted for several years, the **PSSA membership fees will be increased (for 2014) to R400 per member and a R100 for students.**

I hope you enjoy reading our revamped newsletter and please feel free to contact myself or any council member with your suggestions, or even for a chat or discussion. Keep up the hard work for the PSSA Congress in Durban – the perfect destination for such an important meeting!

Current PSSA council members

President	Prof Faadiel Essop	Stellenbosch University
Vice President	Prof Mahendra Channa	University of KwaZulu Natal
Secretary/Treasurer	Dr Ben Loos	Stellenbosch University
Members	Prof Saartjie Roux	Nelson Mandela Metropolitan University (South Campus)
	Dr John Lopes	Stellenbosch University
	Dr Eliton Chivandi	University of the Witwatersrand
	Dr Saramarie Eagleton	University of Johannesburg

Prof Faadiel Essop

Research focus

The Cardio-Metabolic Research Group (CMRG) is headed by Prof. Faadiel Essop and focuses on the growing global burden of diabetes and heart diseases. Moreover, developing countries are facing a 'double burden' of disease, i.e. individuals on anti-retroviral treatment (ART) for HIV-AIDS are also developing cardio-metabolic disorders such as type 2 diabetes and cardiovascular diseases. Thus millions of individuals currently on ARV treatment will further exacerbate the onset of cardio-metabolic diseases. The CMRG research initiatives are highly relevant since future projections indicate that type 2 diabetes and heart diseases will be the major cause of death in developing countries within the next few decades, with those in their prime labor years to be hardest hit. Projections indicate a significantly increased burden of disease that will have serious socio-economic implications including greater health-care costs and diminished productivity. The CMRG focuses on the damaging effects of (short-term and chronic) hyperglycemia on the heart within the context of insulin resistance, myocardial ischemia and



acute heart failure. Specifically, a major objective is to investigate the effects of the non-oxidative glucose pathways in the onset of these conditions. The CMRG is also investigating potential side-effects of ART, i.e. onset of cardio-metabolic complications. The group recently initiated a major clinical project - "Cape Winelands HAART to HEART Study" that evaluates the onset of cardio-metabolic complications in HIV-positive individuals in the Western Cape region of South Africa. If successfully completed, all these studies should make a significant contribution towards the understanding of mechanisms resulting in contractile dysfunction of the diabetic, ischemic and failing heart. This in turn may lead to the development of novel therapeutic interventions to help reduce the overall burden of disease.

Personal comments

I love philosophizing about the deeper meaning of life and this can often result in much longer conversations than what were originally planned!

Prof. Mahendra Channa

Mahendra Channa is an Associate Professor in Physiology in the School of Laboratory Medicine and Medical Sciences, University of KwaZulu-Natal, based on the Westville Campus in Durban.

He is the convener of the PSSA 2014 Conference organizing Committee and the co-opted member of PSSA Council for 2014.



Mahendra has taught Physiology at all levels for the last 32 years. He currently lectures in the BMed Sc, MBChB and the MMed (Psych) programmes and is the Academic Coordinator in the Discipline of Physiology.

His main research area is the pathogenesis of essential Hypertension and his current focus is on oxidative stress, trace metal homeostasis and brain function in rat models of hypertension.

Dr Ben Loos



Research focus

In my research group, DSG-neuro, we have cell biology, cell physiology and biochemistry approaches to dissect and investigate the relationship and role of protein degradation through macroautophagy and cell death susceptibility in cellular pathology of neurons in context of neurodegeneration, neuronal migration and gliomas. Autophagy is an essential process that allows cellular survival in stress conditions through the degradation of long-lived proteins. Since the vast majority of proteins in the cell

are long-lived, its metabolic contribution is significant. Dysfunction in autophagy is associated with numerous pathologies that are characterized by a shift -in either direction- in cell death susceptibility, such as neurodegenerative diseases (Alzheimer's and Parkinson's) or cancer. In order to achieve this, the lab focuses on cellular metabolism, mitochondrial morphology and function, tubulin and transport systems, the cytoskeleton and ATP consumption. Central to our approach is a dynamic perspective on the cell's function and its stress response, in context of its current intracellular and extracellular metabolic parameters.

Research group:

<http://www0.sun.ac.za/physiologicalsci/eng/research.php?id=29>

Personal comments

I am married to an awesome wife and have a 2 year old son – that keeps me inspired, occupied and puts my science life into perspective. My hobbies are running, music like Bach, photography and building exploded skull models. Or just fiddling in the garage with my son, building a wooden racing car... .

Prof. Saartjie Roux (née Scribante)

Research Focus

My academic career started at the University of Potchefstroom, now called the North West University. Under the tutelage of Prof Piet Pretorius, one of the founders of the PSSA, I completed my Masters by investigating the effect of stress on the function of the heart.

I subsequently joined Dr Aletta Meyer at the MRC Pineal Gland Research Unit, University of Pretoria, where I completed my doctoral research on the effect of malnutrition on neurotransmitter synthesis in different brain areas.

My current research at the Nelson Mandela Metropolitan University (NMMU) focuses on the metabolic changes that occur during the development of Type 2 Diabetes. This research has revealed a link between Type 2 Diabetes and the development of colorectal cancer.

Personal Comments

I was appointed as an academic at the University of Port Elizabeth (now NMMU) in 1988 to establish Physiology curricula for various courses in health care professions. I



later introduced Physiology 2 in the BSc curriculum and am very excited that Physiology 3 is now being offered for the first time in 2014. Furthermore, I have served as a council member of the African Association of Physiological Science for the past 8 years and am currently the treasurer. This wonderful opportunity brought me in contact with

Physiologists over the world (especially at IUPS meetings), but especially in Africa. As a council member of PSSA, I look forward to continuing to meet with and serve the interests of Physiologists locally and abroad. Aside from my role as an academic, I am also a wife and mother to two daughters (aged 31 and 29) and a son (aged 28). My family shares my passion for Physiology as my husband, three of my brothers-in-law, and both my daughters are medical doctors so lively discussions regarding any and all aspects of Physiology are the norm in my household! If not talking

about medical aspects then discussion are about outdoor adventures or photography.

Dr Saramarie Eagleton (née De Villiers)

Research Focus:

Students are exposed to a variety of instructional interventions during the course of their Physiology education. My current research interest is to investigate how students perceive these interventions and if these interventions meet their needs for learning satisfaction. The measure for learning satisfaction is a combination of perceptions of course learnability, learning effectiveness, and learning support. Course learnability refers to meeting the needs of students with different learning styles, while learning effectiveness can be



measured by learning outcomes. The social support is best understood by investigating the three concepts identified by Lev Vygotsky being social interaction (between the facilitator and students and between peers), cultural tools (the different learning interventions) and the zone of proximal development (the amount of scaffolding needed).

Personal comments

After matriculating I went to the University of Pretoria where I obtained a BSc (Agriculture) degree with Chemistry and

Biochemistry as my major subjects. My first job was as a researcher at Onderstepoort where I completed my research for a Master's Degree in Physiology at the University of Pretoria under the co-supervision of Johnny van der Walt. I interrupted my career to get married and I have four sons, currently aged 35, 33, 31 and 23! My research interest shifted to education and I did a teachers training diploma at UNISA, and did some high school

teaching before joining the Technikon Witwatersrand (now University of Johannesburg) in 1989. My interest in teaching took me back to the University of Pretoria where I completed a Master's Degree in Computer Assisted Education and then continued to obtain a D Tech in Physiology Education.

Dr. Eliton Chivandi

Research Focus

Primary Interest: Nutrition, nutritional physiology & biochemistry (human and animal nutrition) - primarily nutritive value of indigenous tree seeds (and other non-conventional feed/food sources) and their biochemical and physiological effects in humans and animals.

Secondary interest: Effects of indigenous tree seed extracts and /leaf/root/bark extracts on the development of obesity, metabolic dysfunction and type diabetes mellitus in humans using rat



models.

Personal comments

Time is the only resource that we have in equity. How we use it separates top and bottom achievers.

Dr. John Lopes

Research focus

We investigate the molecular events that respectively promote cardioprotection and cardiac damage during ischemia/reperfusion, using the isolated perfused rat heart and cultured primary adult rat ventricular cardiomyocytes. In this model ischemia mimics acute myocardial ischemia (AMI), commonly known as a heart attack, and reperfusion mimics therapeutic intervention. The pathologies suffered during reperfusion are largely a continuation of pathology suffered during ischemia, and therefore it is imperative that both ischemia and reperfusion is studied. cAMP has a dual role in mediating cardioprotection and cardiac damage during



ischemia/reperfusion in response to different membrane receptors, for example b1-ARs promotes cardiac damage via cAMP during ischemia/reperfusion, while b2-ARs promote cardioprotection via cAMP. Similarly, insulin, GLP-1, opioids, and cannabinoids can all elicit cardioprotection via cAMP. We surmise that phosphodiesterases, enzymes that degrade cAMP, regulate the concentration and location of cAMP throughout the cardiomyocyte in response to membrane receptors, and thereby afford protection or damage during ischemia/reperfusion. Our

focus is therefore to identify the phosphodiesterases that are necessary to promote cardiac damage and protection

respectively, as well as dissect out the associated intracellular cAMP and cGMP compartments, and downstream signalling pathways. In this context, we are currently comparing the signalling profiles of b1-AR, b2-AR, insulin, and cannabinoids during ischemia/reperfusion,

focusing on the involvement phosphodiesterase isoforms 1-5

Personal comment

Let us not reinvent the wheel.



**Announcing the 42nd Annual Conference of the
Physiology Society of Southern Africa
Theme: Physiology in Southern Africa:
Taking back the centre stage of Human Life Sciences
Gateway Hotel, Durban, KwaZulu-Natal,
14-17 September 2014.**

The 42nd annual conference of the PSSA will be held in balmy subtropical Durban this year, hosted by the Discipline of Physiology, University of KwaZulu-Natal.

The conference will run from Sunday, 14 September, starting with a cocktail session, and will close on Wednesday, 17 September. The venue will be the environmentally “green” Gateway Hotel in Umhlanga, 10 minutes away from King Shaka International Airport and 20 km from the Durban city centre.

Umhlanga, Durban’s premier beach resort, is typical of the verdant Kwazulu-Natal countryside, surrounded with lush undulating sugar cane plantations. The Gateway Shopping and Entertainment Complex, the Indian Ocean beaches and a variety of hotels to suit all budgets are all within walking distance from the conference venue. September is early spring in Durban, with pleasant mild weather.

The conference will cater for both established and student researchers to present their work. We will also have

specialist keynote speakers as well as the Wyndham oral presentation competition and the Johnny van de Walt poster competition for graduate students. As always, prize giving will be done at the Gala evening on Tuesday, 16 September.

The PSSA Council together with the Discipline of Physiology at UKZN welcomes you to Durban to showcase your research, interact with other academics, update and exchange ideas, extend your research network and enjoy the sights and sounds of Durban at the same time.

Please look out for the full announcement with all the important dates and relevant booking information. This will be sent out to all PSSA members, Physiology departments and students soon.

Mahendra Channa

Chairperson of the PSSA 2014 Organising Committee

NEWS FLASHES

Why join PSSA?

I pondered this question at the first PSSA council meeting and posed it to the rest of the council members as well. It was felt that although we all have different research interests that could be presented at various focus-specific conferences e.g. diabetes conference, endocrinology conference etc., PSSA showcases the body's vast homeostatic regulatory mechanisms and highlights the interdependence of different organ systems. Our need for specialization can blind us to the multiple homeostatic variables that may influence our research while PSSA sets a platform to be sensitized to role of the same mechanism in another system or slight differences in different systems to fulfill the homeostatic balance. Furthermore, PSSA annual meetings provide members with the opportunity to share teaching strategies that address the needs of the current student generation.

To enhance this uniqueness of the PSSA, the council would like to establish a comprehensive database of local Physiologists that details their field of interest and equipment used. This will enable members to access the database to contact a colleague if specific equipment is needed or if collaboration is sought regarding a specific research methodology. Students will also be able to look for study possibilities if they are interested in a specific research field.

Membership fees normally contribute towards supporting students to attend PSSA conferences. If the membership increases, the PSSA council hopes to gain sufficient interest on the membership fees so as to contribute towards collaboration activities of members e.g. assist with student travel grant to support collaborative research or student training.

(by Saartjie Roux)

Departments/Schools of Physiology are Invited to:



Let Your Interests Be Represented

The Physiology Society of Southern Africa (PSSA) is the community that represents the interests of the discipline of physiology. These interests cover the teaching and research in the different physiology niches. PSSA provides a platform for the interaction of physiologists in South Africa and southern Africa. The voice of physiologists in the regions needs to be heard. We need to stand up and be counted.

Exciting activities have been planned for the next council term and these have to be communicated to all who are involved in the teaching and research in physiology. As the PSSA council, we are appealing to each and every department/school/institute (in all tertiary institutions in South Africa and the Southern African region) that is involved in the teaching of and research in physiology to nominate a PSSA representative for their organisation. The idea is that representatives will be the contact person for the PSSA newsletter and any other communication that may arise. We look forward to receive the contact details of your representative. Please forward these to bloos@sun.ac.za.

(by Eliton Chivandi)

PSSA Youth Platform

In 2013 we hosted, as part of an IUPS initiative by Dr Peace Mabeta (University of Pretoria) and Dr Ben Loos (Stellenbosch University), a Physiology Career session.



Speakers such as Dr Siyanda Makaula, Prof Essop, Dr Wayne Smith shared aspects of their careers, obstacles and challenges. This was followed by a discussion with many questions from the postgraduate student side.

Some of the focal points were related to available equipment and expertise. Where do I find support for a

PSSA Methods and Equipment Database

In 2010 I (John) went to visit a laboratory headed by Prof Manuella Zaccolo at Glasgow University, in order to learn how to measure relative intracellular concentrations of cAMP in cultured primary adult rat cardiomyocytes. Zaccolo's research focussed on the role of phosphodiesterases in mediating cardiac hypertrophy through cAMP compartmentalization, which they measured by expressing a FRET-based cAMP sensor protein in adult rat cardiomyocytes (ARCMs) via viral transduction. The ARCMs were cultured overnight and experiments performed the next day. The viral transduction was very efficient, but most often the isolation and culture of the ARCMs were not. Nevertheless, for their experimental purposes, their system worked well, but not for my purposes.

When I returned to South Africa, my first aim was to quickly set up the isolation and culture procedures for ARCMs so that we could start with cAMP compartmentalization

certain technique? How could I contact someone at a different University that offers a technique that would advance my studies? How could I transfer to another University? How do I know what other groups are offering?

This made us realize that a number of structures need to be established, that will aid you-the post graduate student, in your studies. These areas were taken to the PSSA council, and an action plan was put forward. One of the initiatives is, to establish a youth communication platform, that is linked to the PSSA website. For that purpose, a PSSA youth representative would be voted for by the postgraduate students at the next meeting, that will work closely with the PSSA council. During that time, a youth web-platform/social media platform, similar to e.g. Research Gate, will be established and managed by the PSSA youth representative.

Updates and progress to this undertaking will follow.

(by Ben Loos)

experiments. After all, the isolation and culture of ARCMs had been practised since the 1970s and there were numerous publications where these methods have been used. I did not anticipate that it would take us three years to optimize the necessary conditions to (1) isolate high yields of 70-80% viable ARCM, (2) to maintain viability of the ARCMs in culture, (3) retain adherence of the ARCMs to the culture surface after simulated ischemia experimentation in order to do analysis. We were forced to reinvent the wheel because many publications do not provide detailed methods and refer the reader to other publications. While some publications might provide scant methodology information, others might provide incorrect information. If we had known a laboratory in South Africa that had already optimized these conditions we would surely have reduced our 3 year methods optimization period to less than a year.

This is not an unfamiliar scenario to most of you researchers out there. Many of you must have tried to repeat a method that is published, but can't seem to get it to work, and then

you wonder if it is you or the publication that is wrong. In order to avoid this conundrum we propose to create a database on the PSSA website, where members can list all the techniques that they use in their laboratories, even the methods you might regard as simplistic. In addition, specialized equipment that is too expensive for most laboratories to purchase will also be listed on this data base. This would allow PSSA members to search for laboratories in South Africa that can help in setting up a technique that they are struggling with, or find a laboratory that has the

necessary equipment for those very specialized experiments. No longer will one need to spend years setting up techniques, but rather focus on research questions instead of methods optimizations. All you need to do to get your information onto this data base or to access this data base for information, is to be a member of the PSSA.

(by John Lopes)

PSSA 2013

The 41st PSSA 2013 was organized by the Department of Human Physiology of the University of Limpopo, Medunsa Campus. The society wishes to thank the local organizing team, chaired by Prof Leon Hay, for a most fantastic and outstanding meeting. The scientific standard the venue and every aspect of the organization were most fantastic!

The Physiology Society would like to thank the former PSSA president, Prof Kennedy Erlwanger (University of Witwaterstand) and the former PSSA treasurer & secretary, Prof Hans Strijdom (Stellenbosch University) for outstanding service to the PSSA. We truly appreciate all efforts done to further advance the standing of the society. Thank you!



Above – Prof Leon Hay and his LOC team at work

Left – Prof Kennedy Erlwanger and Prof Hans Strijdom



Student's scientific talks

The student talks and posters presented during the PSSA 2013 were of a fantastic standard. We wish to congratulate all student speakers and presenters for outstanding work done. In our opinion, just being there, presenting under time pressure in the Wyndham or the poster competition made you all winners, and we encourage you to continue to push yourselves even further in the future. The more difficult task was for the adjudication team to select the 3 top poster presenters and the 3 top Wyndham talk presenters.

1. Elize Wolmarans, University of Pretoria
2. Tamzyn Baartman, University of Witwaterstrand
3. Tanusha Dukhan, University of Witwaterstrand

Wyndham (presented by Prof Essop, Stellenbosch University)

1. Kathleen Reyskens, Stellenbosch University
2. Britta Kleeman, University of Cape Town
3. Jorique Calitz, University of Limpopo, Medunsa Campus

Congratulations to our Winners!

Johnny van der Walt (presented by Prof Lochner, Stellenbosch University)



Above – Prof Lochner and the winners of the Johnny van der Walt poster competition



To the right – Prof Essop and the winners of the Wyndham competition

LASEC AWARD: Another highlight of the evening: Prof Stefan du Plessis, Stellenbosch University, received the LASEC award 2013 for the outstanding scientific contribution towards reproductive Physiology research and the Physiology society. Congratulations!

To the right – Prof Stefan du Plessis receives the Lasec award for 2013



PSSA 2013 gala dinner – impressions



Contact details for the PSSA council members

President	Prof Faadiel Essop	Stellenbosch University	mfessop@sun.ac.za
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Secretary/ Treasurer	Dr Ben Loos	Stellenbosch University	bloos@sun.ac.za
Members	Prof Saartjie Roux	Nelson Mandela Metropolitan University (South Campus)	Saartjie.Roux@nmmu.ac.za
	Dr John Lopes	Stellenbosch University	jlopes@sun.ac.za
	Dr Eliton Chivandi	University of the Witwatersrand	Eliton.Chivandi@wits.ac.za
	Dr Saramarie Eagleton	University of Johannesburg	seagleton@uj.ac.za

Please feel free to contact any of the council members with ideas and comments

We are busy 'upgrading' the PSSA website; please visit the website for exiting new developments

<http://www.physiosoc.org.za/>

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