



Biophysical Reviews ‘Meet the editor series’—Addmore Shonhai

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Abstract

It gives me great pleasure to have the opportunity to introduce myself to the readers of Biophysical Reviews as part of the ‘meet the editors’ series. What follows is a mini-autobiography of my life as it relates to my scientific career and research.



Early childhood

I was born in Zimbabwe and grew up at the peak of the war that led to the country gaining independence from Great Britain. I entered the first grade of primary school in 1980 when the country had just gained its independence. I was born to peasant farmer parents although my father was occasionally employed as a primary school teacher. Like most black Zimbabweans of their time, my parents had acquired only a modest education. My family’s main form of survival was farming. Although my parents were poor and had a huge responsibility to look after us, they impressed upon my siblings and I the importance of acquiring an education. Given the history of Zimbabwe at that time, there were very few

schools operating in the country. Each day I had to travel about 15 km (one way) to primary school! Prior to school, my siblings and I would wake up around 02:00 am to work in the fields, and so the long trip to school often came as a relief. On the weekends, my responsibilities included working in the fields and tending to our farm’s cows and goats. Our primary school teachers at the time were not extensively qualified themselves; nonetheless, they gave their best and ensured that all students learn to read and write. By about grade 5, I started enjoying school and realized that I had an interest in debating issues and that I also enjoyed writing. So I joined the primary school debating club which helped me to overcome my shy disposition. An essay that I wrote was suitably impressive enough to allow me to secure a place at Serima High School, a catholic boarding secondary school that was regarded as ‘prestigious’. It was there that I encountered two great teachers who instilled in me a love for science. Mr. Munyenewa taught biology with a passion, and Ms. Getrud Veen (a German native) taught industrial science. Both teachers were inspiring, and I recall that because of their excellent instruction, all of the students generally took a liking for science, irrespective of their primary school background. After completing my general subject ordinary level qualification, I then undertook (and passed) sciences at advanced level. On completing high school education, I entered the newly built National University of Science and Technology (NUST) situated in Zimbabwe’s second largest city of Bulawayo. I enrolled for a Bachelor of Science (BSc) in Applied Biology and Biochemistry and received this degree with honours. What I enjoyed most was the third year of my study which was, by requirement, an ‘industrial attachment year’ during which one had to spend no less than 7 months in an industrial/work setting. I did my industrial attachment at the Central Veterinary Laboratories (CVL) in Harare, the capital city. It was my first time to translate

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science into practice. I enjoyed working in the various labs located within the CVL that included virology, clinical biochemistry, toxicology and bacteriology sections, amongst others. It was there that I conducted my first research project establishing baseline levels of trace metals in ostriches. Upon completion of my degree, I was hired to work on a research project run by a University of Florida/USAID consortium that focused on coming up with a vaccine against heartwater, a deadly disease affecting ruminants. Following this I joined the largest pharmaceutical production company in the country, Caps (Pvt) Ltd. At Caps, I worked as a ‘biologicals’ quality assurance technologist. This further exposed me to the applied side of science.

Academic career and falling for the protein biochemistry bait

After a number of years working as an applied scientist, I took the plunge and enrolled for a postgraduate degree in 2003. I joined Professor Gregory Lloyd Blatch’s¹ laboratory at Rhodes University as a Masters student, and it was Greg who introduced me to protein biochemistry. His area of interest was (and still is) cell stress and molecular chaperones. Greg’s enthusiasm for the field was infectious, and I soon realized that not only was I studying proteins, but I was studying those proteins that took care of other proteins, ensuring their substrates fold and function in the cell. My MSc and then PhD project focused on the molecular characterization of *Plasmodium falciparum* heat shock protein 70 (PfHsp70) (Shonhai et al. 2005; Shonhai 2007). Upon completing my PhD studies, I continued for a year as a postdoctoral fellow in Greg’s lab. I subsequently joined University of Zululand located in South Africa as a lecturer. At the University of Zululand, I set up an independent research group working on heat shock proteins of malaria parasites. I am privileged to be one of the pioneering scientists to work in the heat shock protein field with respect to studying the role of these proteins in the survival and development of malaria parasites. It has been very gratifying to have been able to name a couple of these proteins (Shonhai et al. 2007) and to have contributed to our understanding of their role in the development of malaria parasites. Today, these proteins are also considered prospective antimalarial drug targets (Shonhai 2010; Zininga et al. 2017a). To this end, my current focus is to apply biochemical and biophysical techniques towards understanding not only the structure-function features of these proteins but to explore their prospects as antimalarial drug candidates (Chakafana et al. 2019; Zininga and Shonhai 2019). I currently employ several biophysical techniques such as circular dichroism (CD) and fluorescence spectrometry, small-angle x-ray

scattering (SAXS) and surface plasmon resonance (SPR) (Lebepe et al. 2020; Makumire et al. 2020, 2021) towards elucidating structure-function features of these proteins and mapping out their interactome (Zininga et al. 2015, 2016). My group has also identified small molecule inhibitors that inhibit these proteins with an eye towards drug discovery (Zininga et al. 2017b). I am currently a full Professor of Biochemistry and also Head of the Biochemistry Department at Venda University, South Africa. I am a recipient of a Georg Foster Research Fellowship awarded by the Alexander von Humboldt (AvH) Foundation of Germany. I am extremely grateful to the Germany Research Foundation (DFG) that supported my research from 2009 to around 2018 under the theme, “German-Africa collaboration in infectiology.” I am also very grateful to the National Research Foundation of South Africa which has been another main source of our funding.

Conclusions

My current institution, the University of Venda (South Africa), is, by world standards, a generally under-resourced institution. However, I very much enjoy working with students from disadvantaged backgrounds empowering them with skills that change their destiny. Apart from my research in protein biochemistry and biophysics, I have a passion for training young scientists from Africa in the area of molecular biology and protein biochemistry. These are areas in which skills are in short supply on the continent. Given the challenges we face that are unique to Africa (such as tropical infectious diseases), we desperately need a cadre of young African scientists who are equipped to deal with these challenges.

I am grateful to the *Biophysical Reviews* journal for inviting me to serve on the journal editorial board. Not only do I see this as an opportunity to serve the journal, but it is an opportunity to interface with others in the field of biophysics and help advance the development and progress of this field in both South Africa and the wider continent. Serving on the editorial team of *Biophysical Reviews* is for me a great honour.

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