

CURRICULUM VITAE

Prof. Bongani Kaiser NDIMBA (NRF rated PhD, Durham, England)

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BRIEF PROFILE

I am a Specialist Scientist at the Agricultural Research Council's new Biotechnology Platform (Heading the National Agri-Proteomics Unit). I am also an Associate Professor at the University of the Western Cape (Principal Investigator of the Proteomics Group since 2006). I have 4 years of post-doctoral experience at Durham University in England. I have direct contribution, and leadership, in close to 20 internationally peer-reviewed publications and trained over 20 postgraduates in the past 10 years. Successfully raised over R5M (close to \$1M) national and international research grant funding.

RESEARCH EXPERIENCE

Profile:

2006-Current

- Currently employed by the University of the Western Cape (UWC) as an Associate Professor & Proteomics research laboratory principal investigator. In addition to these duties, I am deputy head of my department, a departmental post-graduate (PG) co-ordinator (>80 PG's/annum) and representative of PG affairs in the faculty committee.
- I established my research laboratory in January 2006, and currently have students ranging from honours to post-doctorate level. My laboratory has a complete workflow Proteomics facility including cutting edge 2-dimensional polyacrylamide gel electrophoresis (2D PAGE) based proteomics tools such as the complete mini-PROTEAN[®] Dodeca[™] Cell system, Ettan[™] IPGphorII, Ettan[™] DALTwelve system (caster & separator), Pharos[™] FX plus, ExQuest[™] spot cutter and two Voyager-DE PRO MALDI-TOF Mass Spectrometry Workstations. Grants invested in the lab since 2006 amount to over R5M (UWC, NRF, Royal Society of London, DST, ARC, CBT and PlantBio). Hitherto, I have trained 4 post docs, graduated 4 PhD/MSc, I completed more than 10 honours, currently training 6 honours, 2 PhDs, co-supervising another 2 (over 20 in total).
- Hitherto, we have unravelled and identified thousands of protein spots via 2D PAGE methods.
- We have identified hundreds of proteins via our own MALDI-TOF Mass spectrometry and further dozens using collaborator's tandem mass spectrometers (England and Denmark).

Main Research Focus and Collaborations:

- Our current investigations include, the large-scale investigation of effects of drought and salinity on the proteome (expressed proteins) of *Arabidopsis thaliana* and *Sorghum bicolor* seedlings. This research is funded mainly by UWC, the NRF the DST and the Royal Society of London. My group hosted two high-profile international proteomics conferences held at UWC, in March 2006 and in March 2008 (sponsors: Royal Society, ARC, CBT and PlantBio) as well as the first the first ever UWC Biotechnology Research Open Day sponsored by the MRC and Invitrogen. With American colleagues – we submitted a 3-year research grant application to Bill Gate's BREAD (Biotechnology Research to Enable Agricultural Development) programme.
- I have an established collaboration (since 2006) with Drs Abram Madiehe (abram.madiehe@mrc.ac.za) and Amanda Skepu (Amanda.skepu@mrc.ac.za) towards a proteomic approach in the investigation and characterisation of potential obesity and diabetes-related proteins and protein biomarkers. So far we have identified at least 5 vital obesity related serum rat proteins. A manuscript for this work is in preparation. Funding for this research is mainly from the medical research council (MRC) and the NRF.

- I am currently working in collaboration with Prof. Melané Vivier and Dr. Sharath Govind (post doc), from the Institute for Wine Biotechnology at Stellenbosch University, on the proteomics of tobacco (*Nicotiana tabacum*) PGIP transgenic model system aiming to move towards grapevine (*Vitis vitifera*) studies. Using gel-based proteomics, we have discovered a number of very interesting putative grape ripening proteins (Sharathcandra et al., 2011, 10-PONE-RA-20842R1) and pathogen stress related proteins. We are planning to publish findings from the pathogen stress proteomics collaboration soon.
- Additionally, working with Prof. Anwar Mall (Surgery Department, UCT), we have successfully isolated, identified and characterised a very important cancer biomarker that Prof. Mall has been working on since the mid 1990's. Working with Mr. Ntato Chirwa, Prof. Mall's PhD student, this project took us approximately six months, from sample collection, proteome isolation, sample preparation, separation, optimisation and protein biomarker identification. A manuscript is under revision following submission for publication in an internationally reviewed journal.

UNIVERSITY EDUCATION

- Post doctoral fellowship funded by the Royal Society of London and the NRF. **2002-2005**
- PhD studies (University of Durham, UK) **1998-2001**

BSc and BSc. (Hons)

Majoring in Biochemistry and Microbiology, University of the Western Cape. **1994-1998**

SELECTED CONFERENCES AND WORKSHOPS

- Invited speaker in the 2010 edition of the Plant & Animal Genome conference in San Diego, California, USA. **2010**
- India-Brazil-South Africa (IBSA) Nanotechnology Summer School Invited Biotechnology Lecturer, Pretoria **2009**
- Department of Science & Technology/Queensland State Australia (QPIF) organised Agriculture Research mission **2009**
- South African Representative in Australian Biotechnology Convention (AusBiotech09) in Melbourne Australia **2009**
- Agricultural Biotechnology Representative in Bill & Melinda Gates Foundation Workshop held in Kenya **2009**
- Talk and Paper Contribution - The 1st International Conference on Corn and Sorghum Research, Thailand **2009**
- National HESA Nominee for RSA Biotechnology Representation in IBSA (India, Brazil, SA) **2008**
- First All Africa Congress on Biotechnology. Presented and published a paper on Sorghum Proteomics **2008**
- Chief organiser of the second biannual international Proteomics Conference, UWC. RSA **2008**
- Invited Cocktail Keynote Speaker at ICGB Proteomics & Protein Bioinformatics Workshop **2007**
- Invited guest speaker at the University of Korea, Seoul **2007**
- Participant in the South Africa/Korea joint Science and Technology Workshop, Seoul **2007**
- Participant in the South Africa/Korea joint Science and Technology Workshop, JHB. SA **2006**
- Presented our *Sorghum bicolor* proteomics findings at the Gordon's Research Conference held during 3-8 September 2006 at Magdalene College in Oxford University, UK. **2006**
- One of the main participants of the 5+5 UK/SA workshop held at FABI of the University of Pretoria. I named the group UKSASAR (UK/SA Sustainable Agricultural Research). **2006**
- Organised, co-ordinated and presented first international Proteomics conference in RSA **2006**
- Research visit to the European Molecular Biology Laboratory (EMBL) Heidelberg, Germany **2006**
- Co-ordinated and presented a series of Proteomics lectures and workshops, NBN, UWC **2005**
- Attended and presented my work at NRF/Royal Society symposium, Pretoria **2004**
- Gave a Proteomics lecture to the Biotechnology dept., University of Western Cape **2003**
- My work was presented at the International Proteomics Conference, Siena, Italy **2002**
- Attended a Proteomics workshop organised by BioRad, Cape Town **2002**
- Presented a poster at the International Proteomics Conference, Munich, Germany **2001**
- Attended the International Proteomics Conference, York, England **2000**
- Attended the Amersham Biotech Proteomics workshop, Manchester, England **2000**
- Attended the Amersham Biotech Proteomics workshop, Edinburgh, Scotland **1999**
- Attended an International Plant Pathology conference in Edinburgh, Scotland **1998**

TEACHING AND OTHER DEPARTMENTAL/FACULTY ACTIVITIES

- BTY Honours course co-ordinator **2007-2010**
- BTY718 Proteomics honours course lecturer **2007-2010**
- BTY719 Biofuels honours course lecturer **2007-2010**

- BTY332 Plant Biotechnology/3rd year Proteomics lecturer, and Practical designer/convener **2006-2010**
- UWC Senior Appointments Committee **2010**
- UWC's New Life Science Building Committee **2007-2009**
- UWC Post Graduate Committee **2009**
- Departmental representative in various Agricultural and Plant Biotechnology related issues **2006-2010**

ACHIEVEMENTS, PROFESSIONAL SERVICE AND OTHER ACTIVITIES

- International Plant Proteomics Organisation (INPPO) member and National NPPO representative (RSA) **2011**
- National Contact Point (NCP) for ESASTAP (a European-South Africa R&D programme; www.esastap.org.za) Nominee **2011**
- Biotechnology Associate Professorship, UWC **2009**
- Agricultural Biotechnology Representative in Bill & Melinda Gates Foundation Workshop held in Kenya **2009**
- Winner of the 2008 Young Researcher of the year **2008**
- NRF rating (Y1), an Internationally peer reviewed National top rating for scientist under the age of 35. **2008**
- Regular reviewer for the international PROTEOMICS journal (proteomics@wiley-vch.de) **2008**
- Stellenbosch University Biotechnology (BTG) External examiner 3rd year & Honours levels **2007-2008**
- National Research Foundation & Innovation Fund grant reviewer and panellist **2006-2008**
- My lab is the leading regional (one of two national) proteomics services provider **2007 - 2008**
- Senior partner in the DST/MINTEK Nanotech biolabels unit – A multimillion rand project **2008 -**
- Chief organiser and host of the first ever international proteomics conference in Africa **2006 & 2008**
- Winner of the first Royal Society International Fellowship for South Africa **2005**
- National Research Foundation and the Royal Society (SA/UK) exchange fellowship **2002-2004**
- Won the Fulbright Scholarship to Cornell University, USA. **1998**
- Won a Commonwealth (ACU) PhD. Scholarship to Durham University, UK. **1998-2001**
- Executive Committee Member, Ruth First Educational Trust, Durham UK. **2000-2006**

PUBLICATIONS & PATENTS

Peer reviewed research papers and Invited Chapters in Books:

Ndimba BK & Ngara R. Chapter on Proteomics of Sorghum and other Saccharinae. "Genomics of the Saccharinae". **2011**, Springer Press, USA,

Sharathchandra R.G, Stander C, Jacobson D, **Ndimba B.K** and Vivier M.A. Proteomic Analysis of Grape Berry Cell Cultures Reveals That Developmentally Regulated Ripening Related Processes Can be Studied Using Cultured Cells. PLoS ONE | February **2011** | Volume 6 | Issue 2 | e14708

Ngara, R. and **Ndimba, B.K.** Mapping and characterisation of the sorghum cell suspension culture secretome. **2011**. African Journal of Biotech. Vol. 10 (2), pp. 253-266.

Thomas LA, Sehata MJ, du Preez MG, Rees JG, **Ndimba BK** "Comparative proteomic analysis of the red and green phenotypes of 'Bon Rouge' pear (*Pyrus communis* L)". **2010**, African Journal of Biotech. Vol. 9 (28), pp. 4334-4341.

Garavaglia BS, Thomas L, Gottig N, Dunger G, Garofalo CG, Daurelio LD, **Ndimba BK**, Orellano EG, Gehring C and Ottado J. The *Xanthomonas axonopodis* pv. *citri* natriuretic peptide counteracts the pathogen-triggered impairment in host photosynthesis. PLoS ONE, **2010** January 2010, 5, 1, e8950

Ndimba BK, Thomas LA and Ngara R. Sorghum 2-Dimensional Proteome Profiles and Analysis of HSP70 Expression Under Salinity Stress. **2010**. Kasetart J. (Nat. Sci.) 44: 768-775.

Garavaglia BS, Thomas L, Zimaro T, Gottig N, Daurelio LD, **Ndimba BK**, Orellano EG, Ottado J, Gehring C. A plant natriuretic peptide-like molecule of the pathogen *Xanthomonas axonopodis* pv. *citri* causes rapid changes in the proteome of its citrus host. BMC Plant Biology **2010**, 10:51.

Ngara, R., Rees D.J.G, **Ndimba B.K.** Establishment of Sorghum Cell Suspension Culture System for Proteomics Studies. *African Journal of Biotechnology*, 2008, 7, 744-749.

Ndimba, BK & Thomas L. Proteomics in South Africa: Current Status, Challenges and Prospects. *Biotechnology Journal*, **2008**, 3, 1368-1374

Chivasa, S., Hamilton, J.M, Pringle, R.S., **Ndimba, B.K.**, Simon, W.J., Lindsey, K., Slabas, A.R. Proteomic analysis of differentially expressed proteins in fungal elicitor-treated Arabidopsis cell cultures. *J Exp Bot.* **2006**, 57, 1553-62.

Ndimba, B.K., Rafudeen, S., Gehring, C., Meyer, Z., Simon, W.J., Chivasa, S., Slabas, A.R. Proteomic Identification of an hsp70.1 induced in *Arabidopsis thaliana* cell suspension cultures stressed with NaCl and Sorbitol. *S. Afr. J. Sci.* **2005**, 101, 449 - 453

Ndimba B.K., Chivasa, S., Simon, W.J., Slabas, A.R. Identification of *Arabidopsis* salt and osmotic stress responsive proteins using two-dimensional difference gel electrophoresis and mass spectrometry. *Proteomics*, **2005**, 5. 4185-4196

Chivasa, S., **Ndimba, B.K.**, Simon, W.J., Lindsey, K., Slabas, A.R. Extracellular ATP functions as an endogenous external metabolite regulating plant cell viability. *Plant Cell*, **2005**, 17, 3019-3034

Chivasa, S., **Ndimba, B.K.**, Simon, J.W., Lindsey, K., and Slabas, A.R. (2005). Organellar proteomics unravels novel signalling pathways in *Arabidopsis thaliana*. *Comparative Biochemistry and Physiology a-Molecular & Integrative Physiology* 141, S251-S251.

Slabas, A., **Ndimba, B.**, Simon, W., Lindsey, K., and Chivasa, S. (2005). A novel cell signalling pathway in *Arabidopsis* revealed by proteomics. *Molecular & Cellular Proteomics* 4, S14-S14.

Slabas, AR., **Ndimba, B.K.**, Simon, W.J., Chivasa, S. Proteomic analysis of the *Arabidopsis* cell wall reveals unexpected proteins with new cellular locations. *Biochem Soc Trans.* **2004**, 32, 524-528.

Ndimba, B.K., Chivasa S., Simon, W.J., Slabas, A.R. Proteomic analysis of changes in the extra-cellular matrix of cell suspension cultures induced by fungal elicitors. *Proteomics* **2003**, 3, 1047-1059.

Hamilton, J.H., Simpson, D.J., Hyman, S.C., **Ndimba, B.K.**, Slabas, A.R. Ara12 subtilisin-like protease from *Arabidopsis thaliana*: purification, substrate specificity and tissue localization. *Biochem J.* **2003**, 15;370, 57-67

Chivasa, S., **Ndimba B.K.**, Simon, W.J., Robertson D., Yu, X-L., Knox, J.P., Bolwell, P., Slabas, A.R. Proteomic analysis of the *Arabidopsis thaliana* cell wall. *Electrophoresis*, **2002**, 23, 1754-1765.

Govind, RS, **Ndimba, BK** and Vivier, M. Proteomic analysis of PGIP transgenic tobacco plants showing elevated resistance to fungal infections. *in preparation*.

Chirwa N, **Ndimba BK**, Thomas L, Melamane X, Govender D, Lotz Z, Tyler M, Panieri E, Kahn D and Mall A. Proteomic identification of an alpha-1-acid glycoprotein in gastric mucus as a biomarker candidate for carcinoma of the stomach. *In preparation*.

Selected Published Conference Proceedings:

Ndimba, B.K., Thomas, L.A. and Ngara, R. (2010). Sorghum 2-dimensional proteome profiles and analysis of Hsp70 expression under salinity stress. *Kasetsart J. (Nat. Sci.)* 44: 768-775.

Ndimba, B.K., Thomas, L.A. and Ngara, R. (2010). Sorghum Proteomics: Towards the understanding of the molecular basis of drought and salinity tolerance in cereals. *Aspects of Applied Biology* 96: 381-385.

Ndimba, B.K. and Ngara, R. (2008). Harnessing the Potential of Biotechnology for food security and socioeconomic development in Africa: Sorghum Proteome Analysis. *Proceedings of the 1st All Africa Congress on Biotechnology*. 88-93.

Patent:

Chivasa, S., **Ndimba, B.K.**, Lindsey, K., Slabas, A.R. Improvements in or Relating to Plant Viability. European Patent **PTC/GB2004/001436** and **CA2519767** in North America.

PERSONAL DETAILS & FAMILY

Born in Port Elizabeth, South Africa in 1974.

Married to Roya Janeen Minnis-Ndimba (Bahamas National – South African Permanent resident).

I have two children - Solomzi James Ndimba 5 years old and MaLisa Julieth Rochelle Ndimba 2 years old.

NON-ACADEMIC HOBBIES AND OTHER THINGS

Farming (co-owner of two cattle farms near Port Elizabeth and Peddie). I play squash, badminton and table tennis with occasional horse and quad bike riding.

NB. This is just a summary of my expertise and work experience. For further information and referees, please do not hesitate to contact me.