

## **PROMECC UNIT**

### **SCIENTIFIC OUTPUTS – 2010**

#### **International Conferences 2010**

1. Abel S, Schuhr I, Gelderblom WCA. The antioxidant potential of oleic acid (C18:1n-9) and effect on cell survival in carcinogenesis. 9th International Society for the Study of Fatty Acids and Lipids (ISSFAL) Conference, Maastricht, The Netherlands, 29 May 29 – 2 June 2010.
2. Abel S, Abrahams C, Gelderblom WCA. Alterations in PUFA profile and oxidative status in liver and colon carcinogenesis. 9th International Society for the Study of Fatty Acids and Lipids (ISSFAL) Conference, Maastricht, The Netherlands, 29 May - 2 June 2010.
3. Abrahams C, Abel S, De Kock M and Gelderblom WCA. Dietary polyunsaturated fatty acids modulate the lipid profile and oxidative status of rat colon mucosa. 15<sup>th</sup> World Conference of Food Science and Technology (IUFoST), Cape Town, South Africa, 22-26 August 2010.
4. Burger H-M, Lombard MJ, Shephard GS, Rheeder JP, Van der Westhuizen L, Gelderblom WCA. Fumonisin exposure in a rural South African population using a validated dietary assessment tool. IUFoST 2010, 15<sup>th</sup> World Congress of Food Science and Technology, Cape Town, 22-26 August 2010.
5. Carl Pray, John Rheeder, Marnus Gouse, Yvette Volkwyn, Liana van der Westhuizen and Gordon S. Shephard. Can Bt Maize Reduce Exposure to the Mycotoxin Fumonisin in South Africa? International Association of Agricultural Economists' 2009 Conference, Beijing, China, 16-22 August 2009.
6. Gelderblom WCA. Mycotoxins: ignorance of undesirable food contaminants – what the pediatrician should know. Workshop on Children's Health and the Environment. 26<sup>th</sup> International Pediatric Association Congress of Pediatrics. Johannesburg, South Africa, 4-9 August 2010.
7. Gelderblom WCA. What the Pediatrician needs to know about mycotoxins. 26<sup>th</sup> International Pediatric Association Congress of Pediatrics. Johannesburg, South Africa, 4-9 August 2010.
8. Gelderblom WCA. Fumonisin in maize in South Africa: Risk management, communication and control. 7<sup>th</sup> IUFoST Conference, Cape Town International Conventional Centre (CTICC) on 23-25 August 2010.

9. Gnonlonfin GJB, Katerere DR, Adjovi Y, Brimer L, Shephard GS, Sanni A. Determination of aflatoxin in cassava chips: Validation of new analytical method in cassava flour. VI Latin American Congress of Mycotoxicology and II International Symposium on Algal and Fungal Toxins for Industry, Merida, Yucatan, Mexico, 27 June - 1 July 2010.
10. Gong YY, Van der Westhuizen L, Wild CP, Burger H-M, Rheeder JP, Gelderblom WCA, Shephard GS. Urinary biomarker for fumonisin exposure in a South African rural intervention study. VI Latin American Congress of Mycotoxicology and II International Symposium on Algal and Fungal Toxins for Industry, Merida, Yucatan, Mexico, 27 June - 1 July 2010.
11. Malherbe CJ, Joubert E, de Beer D, Van der Merwe JD, Gelderblom WCA. Use of online scavenging assays to evaluate the antioxidant activity of phenolic metabolites in liver microsomal fractions without a pre-isolation step. International Analytika Conference, 5-9 December, Stellenbosch University, Stellenbosch.
12. Moses LM, Vismer HF, Marasas WFO and Wingfield BD. Real-Time PCR analyses of fumonisin biosynthetic *FUM* genes in *Fusarium verticillioides* MRC 826 subcultures. IUFoST 15<sup>th</sup> World Congress on Food Science and Technology, Cape Town, South Africa, 22-26 August 2010.
13. Moses LM, Vismer HF and Marasas WFO. Correlating fumonisin production of *Fusarium verticillioides* MRC 826 subcultures with *FUM1* gene expression. SA Congress for Pharmacology and Toxicology, Cape Town, South Africa, 3 – 6 October 2010.
14. Riedel S, Abel S, Humpf H-U, Gelderblom WCA. The role of modulating  $\omega$ 3 fatty acid content in membrane phospholipids during cancer promotion by fumonisin B<sub>1</sub> in rat liver. IUFoST 2010, 15<sup>th</sup> World Congress of Food Science and Technology, Cape Town, 22-26 August 2010.
15. Shephard GS. Detection methodologies in food and their relevance for human health testing. Aflatoxin Convening, Bill and Melinda Gates Foundation, Seattle, Washington, USA, 8-9 March 2010.
16. Shephard GS, Van der Westhuizen L, Burger HM, van Zyl J, Rheeder JP, van Schalkwyk DJ. Risk assessment for the B-and C-series fumonisins in maize and maize-based beverages in rural African communities. VI Latin American Congress of Mycotoxicology and II International Symposium on Algal and Fungal Toxins for Industry, Merida, Yucatan, Mexico, 27 June - 1 July 2010.
17. Shephard GS. Mycotoxin risk assessment and the role of biomarkers. IUFoST 2010, 15<sup>th</sup> World Congress of Food Science and Technology, Cape Town, 22-26 August 2010.

18. Shephard GS. *Fusarium* mycotoxins and human health. 11<sup>th</sup> European Fusarium Seminar, Radzikow, Poland, 20-23 September 2010.
19. Shephard GS. Analytical and other challenges in measuring human mycotoxin biomarkers. 124<sup>th</sup> AOAC International Annual Meeting and Exposition, Orlando, FL, USA, 26-29 September 2010.
20. Shephard GS. Mycotoxins in developing countries: Impact and analytical needs. 124<sup>th</sup> AOAC International Annual Meeting and Exposition, Orlando, FL, USA, 26-29 September 2010.
21. Shephard GS. General Referee's report and Africa update. Mycotoxin Community Meeting, 124<sup>th</sup> AOAC International Annual Meeting and Exposition, Orlando, FL, USA, 26-29 September 2010.
22. Shephard GS. Sampling methods for mycotoxin analysis. ISM-MycoRed Workshop Training Course "Detection techniques for mycotoxins and toxigenic fungi in the food chain", Bari, Italy, 4-8 October 2010.
23. Shephard GS. Determination of fumonisins in maize by HPLC. ISM-MycoRed Workshop Training Course "Detection techniques for mycotoxins and toxigenic fungi in the food chain", Bari, Italy, 4-8 October 2010.
24. Shephard GS. Prevention strategies and HACCP plans for mycotoxins in food safety. ISM-MycoRed Workshop Training Course "Detection techniques for mycotoxins and toxigenic fungi in the food chain", Bari, Italy, 4-8 October 2010.
25. Shephard GS. Human and animal health effects and risk assessment of mycotoxins. ISM-MycoRed Workshop Training Course "Detection techniques for mycotoxins and toxigenic fungi in the food chain", Bari, Italy, 4-8 October 2010.
26. Shephard GS. Health impacts and risk assessment of mycotoxins. MycoRed Workshop Mycotoxicological Risks in Mediterranean Countries: Economic Impact, Prevention, Management and Control, Cairo, Egypt, 25-27 October 2010.
27. Shephard GS. Sampling issues in mycotoxin analysis. MycoRed Workshop Mycotoxicological Risks in Mediterranean Countries: Economic Impact, Prevention, Management and Control, Cairo, Egypt, 25-27 October 2010.
28. Van der Merwe JD, Gelderblom WCA, Joubert E and Manley M. Safety evaluation of an aspalathin enriched rooibos (*Aspalathus linearis*) extract as a cancer chemopreventive agent. 15<sup>th</sup> World Congress of Food Science and Technology, Cape Town, 22-26 August 2010.
29. Van der Westhuizen L, Shephard GS, Burger HM, Rheeder JP, Gelderblom WCA, Wild CP, Gong YY. Reducing fumonisin exposure by simple intervention methods in a rural

area of South Africa. VI Latin American Congress of Mycotoxicology and II International Symposium on Algal and Fungal Toxins for Industry, Merida, Yucatan, Mexico, 27 June - 1 July 2010.

30. Van der Westhuizen L, Shephard GS, Burger HM, Rheeder JP, Gelderblom WCA, Wild CP, Gong YY. Reduction in fumonisin exposure by practical intervention methods in a rural area of South Africa. IUFoST 2010, 15<sup>th</sup> World Congress of Food Science and Technology, Cape Town, 22-26 August 2010.
31. Vismer HF. Impact of *Bt* maize on mycotoxins. IUFoST 2010, 15<sup>th</sup> World Congress of Food Science and Technology, Cape Town, 22-26 August 2010.
32. Vismer HF. Mycotoxins in grains - causes, prevention and control. INTSORMIL-NISIR Sorghum Food Enterprise and Technology Development in Southern Africa Workshop, 6-9 December 2010, Lusaka, Zambia.

### **National Conferences 2010**

1. Abel S, Schuhr I, Gelderblom WCA. The antioxidant potential of oleic acid in FB<sub>1</sub>-induced hepatocarcinogenesis. 23<sup>rd</sup> biannual South African Nutrition Congress, Durban ICC, KwaZulu-Natal, 19-22 September.
2. Abrahams C, Abel S, De Kock M, Swanevelder S and Gelderblom WCA. An altered lipid profile contributes to colon polyp development in rats fed a high fat diet. Medical Research Council's 4<sup>th</sup> Research Day, MRC Conference Centre, Tygerberg, South Africa, 14-15 October 2010.
3. Abrahams S, Moses L, Pfeiffer C, Ghoor S, de Kock M, Joubert E, van der Merwe D, Gelderblom WCA. Implications of altered xenobiotic metabolizing enzyme gene expression by rooibos and honeybush in rats. 13<sup>th</sup> Indigenous Plant Use Forum, 28 June – 1 July 2010, Keimoes Town Hall, Kai !Gariep. (Oral – 3<sup>rd</sup> best paper presentation by a young scientist).
4. Burger H-M, Lombard MJ, Shephard GS, Rheeder JP, van der Westhuizen L, Gelderblom WCA. Dietary fumonisin exposure in a rural population of South Africa. South African Congress for Pharmacology and Toxicology 2010, Cape Town Lodge Hotel, 3-6 October 2010.
5. Gelderblom WCA, Van der Merwe JD, Windvogel S, Riedel S, Abel S, Joubert E. Rooibos as an antioxidant supplement: A cellular perspective. 23<sup>rd</sup> Biennial South African Nutrition Congress. Durban ICC, Kwa-Zulu Natal, 19-22 September 2010.
6. Hon GM, Hassan MS, Van Rensburg SJ, Abel S, Erasmus RT, Matsha T. Free fatty acids in blood cells from patients with Multiple Sclerosis. University of Stellenbosch 54th Annual Academic Day, 11 – 12 August 2010, University of Stellenbosch, Tygerberg Campus.

7. Hon GM, Hassan MS, J van Rensburg S, Abel S, Erasmus RT, Matsha T. Monounsaturated fatty acids, n-9 and n-7 in blood cells from patients with Multiple Sclerosis. FSASP Pathvine 2010 Congress, Lord Charles Hotel, Somerset West, 2-5 September 2010.
8. Malherbe CJ, Joubert E, de Beer D, Van der Merwe JD, Gelderblom WCA. Use of online scavenging assays to evaluate the antioxidant activity of phenolic metabolites in liver microsomal fractions without a pre-isolation step. International Analytika Conference, 5-9 December, Stellenbosch University, Stellenbosch.
9. Ndube N, van der Westhuizen L. and Shephard G.S. UV Detection as an alternative to fluorescence detection for HPLC determination of fumonisins in maize. Analytika 2010, Stellenbosch, 5-9 December 2010.
10. Riedel S, Humpf H-U, Abel S, Gelderblom WCA. Fatty acid modulation of the cytotoxic effects of FB<sub>1</sub> in HepG2 liver cancer cells-implication in cancer promotion. 10<sup>th</sup> AstraZeneca Health Sciences Research Day, University of Stellenbosch, Tygerberg Campus. 25<sup>th</sup> February 2010.
11. Riedel S, Windvogel SL, Joubert E, Marnewick JL, Gelderblom WCA. Chronic exposure to rooibos and honeybush tea – perspectives on the antioxidant status in rat liver. 13<sup>th</sup> Indigenous Plant Use Forum, 28 June – 1 July 2010, Keimoes Town Hall, Kai Gariep. (Oral – 2<sup>nd</sup> best paper presentation by a young scientist)
12. Riedel S, Humpf H-U, Abel S, Gelderblom WCA. The role of polyunsaturated fatty acids in cancer promotion by fumonisin B<sub>1</sub>. South African Congress for Pharmacology and Toxicology 2010, Cape Town Lodge, 3 – 6 October 2010.
13. Rheeder JP, Volkwyn YE, van der Westhuizen L, Imrie G, Shephard GS, Vismer HF, Gouse M, Pray CE. Reduction of Fumonisin and *Fusarium* Contamination in Different Transgenic, Conventional and Traditional Maize Hybrids in Rural KwaZulu-Natal, South Africa. South African Congress for Pharmacology and Toxicology 2010, Cape Town Lodge Hotel, 3-6 October 2010.
14. Shephard GS. Aflatoxin and cancer. Cancer Association of South Africa Biennial Research Conference “Awareness, coping and beyond: A women’s health cancer conference for our time”, Johannesburg, 8-10 September 2010.
15. Sissing L, Gamielien K, Marnewick J, Joubert E, De Kock M, Gelderblom W. Modulation of N-methylbenzyl nitrosamine-induced oesophageal papillomas in rats by *Aspalathus linearis*, *Cyclopia intermedia* and *Sutherlandia frutescens*. 38<sup>th</sup> Congress of the Physiology Society of Southern Africa, East London, 27-29 September 2010.
16. Vismer HF. Food safety aspects of commercial, subsistence, organic and genetically modified foods in relation to mycotoxin contamination. The Nutrition Society of South

Africa (NSSA), Food Safety and Food Security Mini Symposium, University of Stellenbosch, Medical School, 10 February 2010.

17. Vismar HF. Contemporary overview of emerging and re-emerging fungal pathogens. SMLTSA 7<sup>th</sup> Annual Academic Day, Fairways Conference Centre, Welgemoed, 18 September 2010.
18. Windvogel SL, Gamielien K, Maritz GS and Gelderblom WCA (2010) Maternal nicotine exposure and neonatal lung development: investigating the modulating effect of rooibos (*aspalathus linearis*) on antioxidant enzyme activity in the rat lung. 38<sup>th</sup> Congress of the Physiology Society of Southern Africa, East London, 27-29 September 2010.
19. Van der Westhuizen L, Gong YY, Shephard GS, Burger H-M, Rheeder JP, Gelderblom WCA, Wild CP. Fumonisin B<sub>1</sub> as a biomarker of exposure in a rural intervention study. Analitika 2010, Stellenbosch, 5-9 December 2010.
20. Volkwyn YE, Shephard GS, van der Westhuizen L. Determination of the mycotoxin moniliformin in maize by ion-pair HPLC. Analitika 2010, Stellenbosch, 5-9 December 2010.

#### **Seminars at PROMEC**

1. Mr Benoit Gnonlonfin, *University of Abomey-Calavi, Benin*: Aflatoxin Contamination in Cassava Chips and Assessment of *Manihot esculenta* Crantz Auto-defense Mechanism. (13 November 2009)
2. Ms H Burger, Fumonisin exposure, maize intakes and related dietary practises in rural Centane. (04 December 2009)
3. Ms L van der Westhuizen, Evaluation of Practical Intervention Methods to Reduce Fumonisin Exposure in Rural Community of South. Africa. (04 December 2009)
4. Mrs Aragea Holland-Fredericks from the Operations Division, Safety Health and Environment (05 March 2010)
5. Ms Dinie Hon from the Department of Bio-Medical Sciences, CPUT (Bellville Campus), Membrane fluidity and fatty acids in multiple sclerosis (11 June 2010).
6. Prof Vicente Sanchis Almenar from Food Technology Department, University of Lleida, Lleida, Spain: Prevention of postharvest patulin contamination in apples intended for juice production (22 June 2010).
7. Dr Stephanie Midgeley from OneWorld Sustainable Investments: Climate change and food security in Southern Africa (10 Sept 2010).

8. Prof DC Hiss from Department of Biosciences, UWC: Molecular targeting of the Resistance Phenotype in Cancer: The Promise of Synergistic Drug Combinations (02 Nov 2010).

### Registered Post-Graduate Students

1. Ms C Abrahams, PhD Medical Biosciences, University of the Western Cape. Thesis title: The modulation of colon carcinogenesis by dietary  $\omega$ -6/ $\omega$ -3 fatty acid ratio: a chemopreventive strategy. (Supervisor: Dr S Abel; Co-supervisors: Prof WCA Gelderblom, Prof M de Kock)
2. Ms S Abrahams, MSc Medical Biosciences. Thesis title: Differential expression of Drug Metabolising Enzymes in the Liver: Effect of rooibos and honeybush herbal teas with special reference to Phase I and II enzymes. (Prof WCA Gelderblom, M De Kock and K Gamielien: Co-study Leaders)
3. Ms H-M Burger, PhD Biochemistry, University of Stellenbosch. Thesis title: Investigations into possible mechanisms involved in the induction of cancer by fumonisin B<sub>1</sub> (FB<sub>1</sub>), by using a hepato- and oesophageal carcinoma cell-model (Prof P Swart, Promoter and Prof WCA Gelderblom: Co-promoter)
4. Dr N Govender (MD). MSc Medical Mycology. UCL, Department of Infection, Centre for Clinical Microbiology, Royal Free and University College Medical School, London, MW3 2PF. (Dr HF Vismer: Supervisor)
5. Mr B Gnonlonfin, PhD, Department of Pathobiology, University of Copenhagen. Thesis title: Aflatoxin contamination on cassava chips and assessment of its auto-defence mechanism. (Dr GS Shephard: Co-supervisor).
6. Mr C Hikuam, PhD, Department of Biomedical Sciences, CPUT. Health promoting properties of South African indigenous plants. (Prof WCA Gelderblom, External Promoter)
7. Ms D Kotzé, PhD, Department Botany and Zoology, US, Thesis title: Pharmacological analysis of propagated and non-propagated plants of *Pelargonium sidoides* DC and *Pelargonium reniforme* Curtis. (Dr HF Vismer: Co-promoter).
8. Mrs MJ Lombard, PhD UCT. Thesis title: Development and validation of a culturally specific dietary assessment tool to determine habitual dietary patterns of people living in high OC risk areas in rural Transkei. (Ms H Burger: External Advisor).
9. Ms TU Magcwebaba, PhD, Biochemistry, University of Stellenbosch. Thesis title: Therapeutic effects of South African herbal teas, Rooibos and Honeybush on skin cancer. (Profs WCA Gelderblom, P Swart and Dr K Gamielien: Promoter/Co-promoters).

10. Ms LM Moses, PhD Genetics, UP. Thesis title: Fumonisin regulatory genes in *Fusarium verticillioides* and other potential fumonisin producing fungi (Prof WFO Marasas and Dr HF Vismer: Co-promoters).
11. Ms Ncediwe Ndube, MSc UWC. Thesis title: Determination of fumonisins in maize by HPLC with ultraviolet detection of *o*-phthaldialdehyde, naphthalene-2,3-dicarboxaldehyde and dansyl chloride derivatives. (Dr GS Shephard and Ms L van der Westhuizen: Co-promoters).
12. Ms S Riedel, PhD, Westfälische Wilhems-Universität Münster, Germany. Thesis title: Modulation of lipid metabolism as a possible tool to prevent carcinogenic effects of fumonisin B<sub>1</sub> in rat liver (Prof WCA Gelderblom: Advisor).
13. Ms S Samodien, PhD Physiology, UWC. Thesis title: Flavonoid concentrates as chemopreventive agents. (Prof WCA Gelderblom, Promoter, Drs Abel/Gamielidien and Prof M de Kock: Co-promoters).
14. Mr KM Thembo, PhD University of Limpopo. Thesis title: Developing anti-fungal pesticides from plants (Drs DR Katerere and HF Vismer: Co-supervisor).
15. Ms D van der Merwe, PhD Food Science, US. Thesis title: Bioavailability of major polyphenols present in South African herbal teas, rooibos (*Aspalathus linearis*) and honeybush (*Cyclopia intermedia*) (Prof WCA Gelderblom: Promoter).
16. Ms L van der Westhuizen, PhD Medical Biochemistry, University Stellenbosch. Thesis title: Fumonisin exposure biomarkers in humans consuming maize staple diets (Dr GS Shephard: Promoter).
17. Ms JM Vreulink, PhD Microbiology, University of Stellenbosch. Thesis title: Comparing South African *Cryptococcus neoformans* and *Cryptococcus gattii* isolates with regard to their growth on natural substrates and resistance profiles to prescribed antifungal treatments. (Dr HF Vismer: Co-promoter).

### **Theses Examined**

1. Petrova Antoinette (2010) Modulation of UVB-induced skin carcinogenesis by extracts of rooibos and honeybush using a mouse model: elucidating possible protective mechanism. MTech (Biomedical Technology), Cape Peninsula University of Technology. (Prof WCA Gelderblom).
2. Mutemwa Muyunda (2010) Maternal nicotine exposure during gestation and lactation induce premature aging of lungs of the offspring. MSc degree, Department of Medical Biosciences, University of the Western Cape (Prof WCA Gelderblom).

### **Scientific Committees**

1. Prof WCA Gelderblom was invited to serve on the Mycotoxin Research Peer Review panel of the Maize Trust.
2. Dr GS Shephard was re-appointed to the editorial board of Applied and Environmental Microbiology for the period 1 January 2011 through 31 December 2013.
3. Dr GS Shephard elected as voting member of the AOAC International Mycotoxin Community.