

RESUMÉ

Dr John P. Moore (*Researcher in Wine Biotechnology*)

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Research Interests:

GRAPEVINE BIOTECHNOLOGY: THE CELL WALL AND BIOTIC (FUNGAL DISEASE)/ ABIOTIC (DESICCATION/DROUGHT) STRESS RESISTANCE

My research area forms part of the Grapevine Biotechnology programme (within the framework of the NRF supported Wine Science Research Niche Area (RNA)) of the Institute for Wine Biotechnology (IWBT) in collaboration with Professor Melané Vivier and Dr Philip Young. The goals of the programme are to improve the disease resistance, fruit quality and abiotic stress (i.e. drought) tolerance of *Vitis vinifera* (grapevine) cultivars utilising transgenic technology. My specific research aims are to understand the biochemical and metabolic aspects of berry development, plant pathology and abiotic stress tolerance in grapevine with a focus on the role of the cell wall. Current research includes unravelling the *in vitro*, *in vivo* and *in planta* interactions between endopolygalacturonases, polygalacturonase inhibitory proteins (PGIPs) and the cell wall of *Vitis vinifera* in response to fungal pathogen infection. Pathogens studied include *Botrytis cinerea*, a fungus responsible for both grey and noble rot in grapevine. Other areas of interest are osmotic processes associated with grape berry development and the effects of water deficit stress on grapevine physiology and metabolism.



WINE BIOTECHNOLOGY: MANNOPROTEINS AND THE CELL WALL OF WINE YEAST

A further strand of research undertaken in collaboration with Professor Florian Bauer, Dr Benoit Divol and Dr H el ene Nieuwoudt involves investigating the role of mannoproteins (amongst other wall glycoproteins) in relation to growth and fermentation phenotypes of wine yeast (*Saccharomyces cerevisiae*). The approach taken is multi-disciplinary in nature involving techniques from a range of fields (i.e. molecular biology, chemistry, biochemistry (enzymology), microscopy, immunocytochemistry and spectroscopy). I also maintain an interest in the chemistry and biology of plant polyphenols with particular reference to their functional significance *in planta* as well as being key constituents of grapes and wine.

FUNCTIONAL WINE-OMICS AND SYSTEMS BIOLOGY

The 'Functional Wine-omics' research strategy of the IWBT requires the development of a systems biology approach (i.e. transcriptomics, proteomics and metabolomics) coupled with chemometric analysis. This provides an impetus to develop metabolomic technology utilizing Stellenbosch University's and the IWBT's extensive chemical-analytical facilities. My research focus is aimed at actively pursuing local and international collaboration to develop 'metabolomics' technology at the IWBT.

QUALIFICATIONS

- BSc (Biochemistry and Microbiology), University of Cape Town, 2000.
- BSc(Hons) (Biochemistry), University of Cape Town, 2001 (*awarded First Class*).
- PhD (Molecular and Cell Biology), University of Cape Town (partly undertaken at the University of Rouen, France), 2006. "The role of polyphenols and the cell wall in relation to the desiccation tolerance of the resurrection plant, *Myrothamnus flabellifolia* (Welw.)"
- Post-Doctoral Research Fellowship, University of Edinburgh, United Kingdom, 2006-2007.

WORK EXPERIENCE

Academic experience:

- Research Assistant, Department of Biochemistry, University of Cape Town, 1999 - 2000.
- Tutor, Biochemistry 2nd, 3rd and honours classes, University of Cape Town, 2001-2007.
- Tutor, Abbots College, Milnerton, Cape Town, 2006.

- Tutor, University of Edinburgh, 2006-2007.
- Post-Doctoral Research Fellow, University of Edinburgh, 2006-2007.
- Researcher, Institute for Wine Biotechnology, Stellenbosch University (since November 2007).

AWARDS, GRANTS AND DISTINCTIONS

- Entrance Merit Scholarship, University of Cape Town, 1998.
- Class Medal in Biochemistry, University of Cape Town, 1999.
- Dean's Merit List, University of Cape Town, 1999-2000.
- Golden Key International Honour Society Membership, 2000.
- Honours Scholarship, University of Cape Town, 2001.
- Honours Class Medal, University of Cape Town, 2001.
- French Research Fellowship, University of Rouen, Normandy, France, 2002.

- Myer-Levinson Scholarship, University of Cape Town, 2002-2003.
- Grantholder Bursary, National Research Foundation, 2002-2003.
- Research Associateship, University of Cape Town, 2003-2005.
- Prestigious Doctoral Scholarship, National Research Foundation, 2004-2005.
- Travel Grant, National Research Foundation, 2004.
- Conference Travel Grant, University of Cape Town, 2004.
- KW Johnstone Bequest Scholarship, University of Cape Town, 2004-2005.
- DAAD (German) PhD Scholarship, Deutscher Akademischer Austauschdienst, 2004-2005.
- French NRF Exchange Program, University of Rouen, Normandy, France, 2005.
- AAAS Sponsored Membership, 'Program for Excellence in Science', American Association for the Advancement of Science, 2004-2006.
- Postgraduate Publication Incentive Bursary, University of Cape Town, 2006.
- Prestigious Overseas Post-Doctoral Fellowship, National Research Foundation, at the University of Edinburgh, United Kingdom, 2006-2007.
- Subcommittee B Research Grant, Stellenbosch University, 2008-2010.
- Mannoprotein Research Project Grant, Winetech and THRIP, 2008-2010.
- Cell Wall Platform Technology Grant, Winetech, DFPT and THRIP, 2009-2011

TEACHING

Postgraduate teaching courses

- IWBT 772 Course Co-ordinator (HonsBSc in Wine Biotechnology) (with Dr Benoit Divol)
- IWBT 714 (HonsBSc) Chemical constituents of grapes and wine (with Dr WJ du Toit)
- IWBT 775 (HonsBSc) Molecular biology and biotechnology of grapevine (with Prof M Vivier, Dr P Young and Mr A Strever)

Postgraduate supervision

- Graduated : HonsBSc (Wine Biotechnology) 8
- Registered : HonsBSc (Wine Biotechnology) 3
- Registered : MSc (Wine Biotechnology) 2
- Registered : PhD (Wine Biotechnology) 1

Postdoctoral Fellows

- Registered : Claude Harris Leon Funded 1

RESEARCH

Research programme

- Research area: *Grapevine Biochemistry and Wine Metabolomics* within the framework of the Grapevine Biotechnology programme of the Institute with a focus on the physiology and biochemistry of plant cell walls in relation to fruit development, disease resistance and abiotic stress tolerance.
- Research area: *Yeast Molecular Biology and Biotechnology* with a focus on the role of the cell wall and mannoproteins of wine yeast in contributing to fermentation phenotypes (e.g. flocculation, haze etc.)
- Part of Wine Science Research Niche Area (RNA) of the National Research Foundation.

Research collaborators and support:

- Prof. MA Vivier, Dr P Young (Grapevine Biotechnology Programme), Mr A Strever (Viticulture) and Dr H Nieuwoudt (Chemical Analytical facility, IWBT-DVO).
- Academic participants of the Institute for Wine Biotechnology, Department of Viticulture and Oenology, Department of Chemistry, Department of Food Science and regional partners within the Wine Science RNA programme.
- Ms A Oberholzer, Dr W du Toit (Oenology)
- Prof. J Kossmann and Dr. J Lloyd (Institute for Plant Biotechnology, Stellenbosch University)
- Dr A de Villiers (Department of Chemistry, Stellenbosch University)
- Professors W Brandt and J Farrant (Department of Molecular and Cell Biology, University of Cape Town)
- Prof. T Sewell, Mr M Jaffer, Mrs M Waldron (Electron Microscope Unit, University of Cape Town)
- Prof. A Driouich, Dr. M Vicré-Gibouin (University of Rouen, France)
- Prof. K Esbensen (Aalborg University, Denmark)

Research outputs (since 2003)

- Papers in refereed scientific journals 10
- Popular scientific articles 1
- Abstracts of papers at conferences 12

Managerial responsibilities at IWBT

- Member, IWBT Management Committee, since November 2007.
- IWBT HonsBSc Course Coordinator 2008 and 2009.
- Risk (Health and Safety) Manager for the IWBT and Department of Viticulture and Oenology.
- Radioisotope Safety Officer for the IWBT and Department of Viticulture and Oenology.

Additional qualifications

- Certificates in Radioisotope Safety Training, Wine Evaluation, Fluorescence Microscopy, Postgraduate Supervision, French, Advanced Chemometrics and Multivariate Statistics.

Other professional activities

- PhD thesis defence committee, Stellenbosch University.
- MSc thesis examiner, University of Cape Town.
- PhD thesis examiner, University of Rouen, France.
- Reviewer for 7 international plant science and 2 international wine science journals.
- Reviewer for the National Research Foundation.
- Organising committee member and session chair at the South African Chemometrics Society Symposium at Stellenbosch in 2008.
- Committee member to decide the 'Best Botanical PhD Thesis in 2009' at the South African Association of Botanists meeting in Stellenbosch in 2009.

Updated: 2009 April