

RÉSUMÉ

Dr Benoit Divol (Researcher in Wine Biotechnology)

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Vision statement:

The main aim of my research is to contribute to the global understanding of wine microorganisms, individually and collectively and their impact on wine composition throughout vinification. Traditional microbiology and molecular biology techniques are used but omics technologies now offer opportunities to improve our knowledge at greater levels and are therefore increasingly implemented.

My research focuses on three main areas: (1) evaluating the influence of non-*Saccharomyces* yeasts on wine organoleptic and technological properties – with a specific focus on extracellular enzymes (this work is extended to lactic acid bacteria via collaboration with Prof Maret du Toit), (2) microbial interactions and opportunities to control spoilage – with a specific focus on killer toxins secreted by non-*Saccharomyces* yeasts and (3) *Brettanomyces bruxellensis*: detection from wine and cellular and molecular responses to sulphur dioxide.

PERSONAL INFORMATION

33 years old
Single

QUALIFICATIONS

- **Diplôme National d’Œnologue** (National Diploma in Oenology; BSc level), Bordeaux 2 University, France
- **Diplôme d’Ingenieur des Techniques Agricoles** (Engineer diploma in agriculture, MSc level), ENITA de Bordeaux, France
- **Diplôme d’Études Approfondies œnologie-ampélogie** (Diploma in advanced studies in oenology-ampelology, MSc level), Bordeaux 2 University, France

Genetic study of arginine transport in Oenococcus oeni. Implication in the metabolism.

- **Doctorat (PhD)**, INP de Toulouse, France
Botrytis-affected wines microbiology during maturation. Genetic characterisation of Saccharomyces cerevisiae strains responsible for refermentations.

- **Habilitation à Diriger des Recherches en œnologie** (DSc in oenology), Bordeaux 2 University, France

Wine microorganisms: towards a better understanding for a better control

NRF RATING

- Y1 (since 01 January 2011)

WORKING EXPERIENCE

- Post-doctoral fellow, Institute for Wine Biotechnology, Stellenbosch University, South Africa (June 2005 – October 2007)

Regulation of the PGU1 gene (encoding for an endopolygalacturonase) in Saccharomyces cerevisiae. Implication in aroma release and improvement of filtration in wine.

- Researcher in Wine Biotechnology, Institute for Wine Biotechnology, Stellenbosch University, South Africa (since November 2007)

Main research focuses:

- Enzymes production by wine yeasts and lactic acid bacteria: influence on the organoleptic and technical properties of wine
- Interactions between microorganisms: influence of yeast killer toxins on yeast populations during winemaking
 - spoilage microorganisms: *Brettanomyces bruxellensis* and its response to SO₂

BURSARIES and AWARDS

- PhD funded by the Syndicat des crus classés de Sauternes et Barsac and by Château d’Yquem
- National Research Foundation Block Grant for International Travel 2008 (attendance of conference abroad)

TEACHING

Undergraduate teaching courses

- Practical work: determination of sulphur dioxide concentration in wine
- *Ad hoc* lectures on wine microorganisms

Postgraduate teaching courses

- Lectures and practical work: Grape-based beverages
- Practical work: Microbiology techniques

Postgraduate supervision

- Graduates:**16**
- Joint supervision of Honours students 11
- Supervisor for MSc students 1
- Co-supervisor for MSc students 2
- Co-supervisor for PhD students 2

- Registered students:**4**
- Co-supervisor for PhD-students 2
- Supervisor for MSc-students 2

Staff supervision

- Technical officers 2

RESEARCH

Research programme

Various running projects of relevance for the wine industry are currently on-going:

- Polygalacturonase activity in *Saccharomyces cerevisiae* and *S. paradoxus* – potential applications in winemaking
- Genetic characterisation of β -glucosidase-encoding genes of non-*Saccharomyces* yeasts – potential application in winemaking
- Investigating presence and activity of proteases of wine micro-organisms for potential use in oenology
- Monitoring extracellular enzyme activities during winemaking with a specific focus on enzymes secreted by selected non-*Saccharomyces* yeasts
- Genetic investigation and characterization of killer toxins secreted by non-*Saccharomyces* yeasts
- Developing a fast and reliable technique for detecting *Brettanomyces/Dekkera* spp. and investigating their response to sulphur dioxide

In collaboration with Prof Maret du Toit:

- Evaluating the influence of lactic acid bacteria and malolactic fermentation on the chemical profile of wine with omics-technologies and multi-variate data analysis.

In collaboration with Prof Florian Bauer:

- Mannoproteins and their role in the reduction of protein haze in white wines

- Act as a regular reviewer for 9 international peer-reviewed journals

Updated: January 2011

External research collaborators

- Institut des Sciences de la Vigne et du Vin, Bordeaux 2 University, France (Dr Marina Bely) on killer toxins project
- Institut Universitaire des Sciences de la Vigne et du Vin, University of Burgundy, France (Prof Hervé Alexandre) on *Brettanomyces* project (*Application for funding submitted*)

Research outputs (since 2001)

- | | |
|--|---------|
| ▪ Papers in refereed scientific journals | 15 |
| ▪ Popular scientific articles | 2 |
| ▪ Book chapters | 2 |
| ▪ Published conference proceedings | 3 |
| ▪ Papers at conferences | 3 |
| ▪ Posters at conferences | 31 |
| - international | 20 |
| - national | 11 |

Scopus h-index: 5

SERVICES

Managerial services for IWBT management team

- Member of the IWBT management team
- General coordinator of the BSc(Hons) post-graduate studies
- Supervisor of the IWBT culture collection management
- Supervisor of post-graduate students and staff members

Membership of professional societies

- Member of the South African Society for Enology and Viticulture (since 2008)
- Member of UNESCO Chair “Culture et traditions du vin” (since 2008)

Other professional services

- Internal examiner of 5 PhD thesis and 3 MSc theses, DVO and IWBT, Stellenbosch University