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Research Interests

The AWRI is located at the Waite campus within the new Wine Innovation Cluster central building. The Wine Biosciences group at the AWRI undertakes a variety of research projects involving industrial strains of yeast and bacteria, such as those used in biofuel production, baking, brewing, winemaking and pharmaceutical production. These industrial microorganisms play a critical role in these biotechnology industries with the development of new and improved strains having a direct benefit either through improving existing processes or by allowing for the development of new industrial applications such as in the production of a new chemical compound or drug.

We are applying cutting-edge molecular techniques such as next-generation DNA sequencing and whole-genome technologies such as transcriptomics and metabolomics to understand how cells function at the whole-cell level. We then use this knowledge of the cell to engineer the growth and metabolism of the cell to allow these designer strains to work more efficiently, perform new functions or even synthesis complex chemical compounds in an industrial setting.

Recent publications

Borneman A.R., Forgan A.H., Pretorius .I.S, Chambers P.J. (2008) Comparative genome analysis of a *Saccharomyces cerevisiae* wine strain. *FEMS Yeast Res.* **8**:1185-1195

Borneman A.R., Chambers P.J., Pretorius I.S. (2007) Yeast systems biology: modelling the winemaker's art. *Trends Biotechnol.* 2007 **25**:349-355.

Borneman A.R., Gianoulis T.A., Zhang Z.D., Yu H., Rozowsky J., Seringhaus M.R., Wang L.Y., Gerstein M., Snyder M. (2007) Divergence of transcription factor binding sites across related yeast species. *Science* **317**:815-819.

Borneman A.R., Zhang Z.D., Rozowsky J., Seringhaus M.R., Gerstein M., Snyder M. (2007) Transcription factor binding site identification in yeast: a comparison of high-density oligonucleotide and PCR-based microarray platforms. *Funct. Integr. Genomics* **7**:335-345.

Borneman A.R., Leigh-Bell J.A., Yu H., Bertone P., Gerstein M., Snyder M. (2006) Target hub proteins serve as master regulators of development in yeast. *Genes Dev.* **20**:435-448.