Roy James THORNTON

Department of Viticulture & Enology
California State University, Fresno
Fresno, CA 93740-8003

Education

Ph.D., Applied Microbiology (1970) Strathclyde University, Glasgow, Scotland
Thesis: *Genetic variation in yeast during extended cultivation.*
B.Sc. Honours, Applied Microbiology (1966) Strathclyde University

Professional experience

Professor, Enology, 2001- present, Dept. of Viticulture & Enology, California State University, Fresno, CA
Senior Research Microbiologist, 1996–2001, E & J Gallo Winery, Modesto, CA
Assistant Professor (shortened tenure track), 1993-96, Indiana University
Education & Training Manager, March - July 1993, Biolog Inc., Hayward, CA
Consultant, 1991-93, Fermentation Science, Applied Microbiology
Senior Lecturer extended scale, 1985-91**; Senior Lecturer** 1978-84; **Lecturer**, 1971-77
Dept. of Microbiology & Genetics, Massey University, Palmerston North, New Zealand

Publications

Rodriguez, SB, Thornton, MA, Thornton, RJ (2013) Raman Spectroscopy and Chemometrics for Identification and Strain Discrimination of the Wine Spoilage Yeasts *Saccharomyces cerevisiae*, *Zygosaccharomyces bailii*, and *Brettanomyces bruxellensis.* Applied & Environmental Microbiology, October 2013, Volume 79, Number 20, 6264 - 6270

Rodriguez, SB, and Thornton, RJ (2008) Use of flow cytometry with fluorescent antibodies in real-time monitoring of simultaneously inoculated alcoholic-malolactic fermentation of Chardonnay. Letts Appl Microbiol **46**: 38 – 42.

***Farthing, JB, Rodriguez, SB, and Thornton, RJ* (2007)** Flow cytometric analysis of *Saccharomyces cerevisiae* populations in high sugar Chardonnay fermentations. J Sci Food Agric **87:**527 - 533

Chaney, D. E., Rodriguez, S. B. Fugelsang, K. C., and Thornton, R.J. (2006) Managing high density commercial-scale wine fermentations. J. Appl. Microbiol. **100** (2006) 689 – 698.

Thornton R J, Godfrey W, Gilmour L, Alsharif R. (2002) Evaluation of Yeast Viability and Concentration during Wine Fermentation Using Flow Cytometry. Becton Dickinson Application Note http://www.bdbiosciences.com/immunocytometry_systems/application_notes/

Rodriguez, S. B. & R. J. Thornton. (2002) 'Microbiology' in Scribner's Encyclopedia of Food and Culture, Solomon Katz (Ed).

Lubbers, M. W., Tweedie, J.W., Rodriguez, S. B. and Thornton, R. J. (1991) Purification and characterization of *Schizosaccharomyces pombe* urease. Proceedings of the International Symposium on Nitrogen in Grapes & Wine. Rantz, J. (ed.), Seattle, Washington, USA.18-19 June 1991. pp. 320-3.

Lubbers, MW, Thornton, RJ and NK Honey (1997) Mapping of *ure1*, *ure2* and *ure3* markers in fission yeast. Yeast **13**: 1195 – 1197.

***Harrod, CJ, Rodriguez, SB and Thornton, RJ (1997*)** Derepressed utilization of L-malic acid and succinic acid by mutants of *Pachysolen tannophilus*. J Industrial Microbiol Biotechnol **18**: 379-383.

Thornton, R. J. and Rodriguez, S. B. (1996) Deacidification of red and white wines by a mutant of *Schizosaccharomyces malidevorans* under commercial winemaking conditions. Food Microbiology **13**, pp. 475 - 482

Lubbers, MW, Rodriguez SB, NK Honey and RJ Thornton (1996) Purification and characterization of urease from *Schizosaccharomyces pombe.* Canadian Journal for Microbiology. **42**, pp. 132 - 140

Thornton, R. J., (1991) Wine Yeast Research in New Zealand and Australia. CRC Critic. Rev. Biotechnol. **11**, pp. 327-345.

Rodriguez, S. B. and Thornton, R. J. (1990) Factors affecting the utilisation of L-malate by five genera of yeast. FEMS Microbiol. Lett. **72**, pp. 17-22.

Rodriguez, S. B., Amberg, E., Thornton, R. J. and Mclellan, M. R. (1990) Malolactic fermentation in Chardonnay: growth and sensory effects of commercial strains of *Leuconstoc oenos.* J. Appl. Bacteriol. **68**, pp. 139-144.

Rodriguez, S. B. and Thornton, R. J. (1989) A malic acid dependent mutant of *Schizosaccharomyces malidevorans.* Arch. Microbiol. **152**, pp. 564-566.

Wedlock, D. N., James, A. P. and Thornton, R. J. (1989) Glucose-negative mutants of *Pachysolen tannophilus.* J. Gen. Microbiol. **135**, pp. 2019-2026.

Wedlock, D. N. and Thornton, R. J. (1989) A hexokinase associated with catabolite repression in *Pachysolen tannophilus.* J. Gen. Microbiol. **135**, pp. 2013-2018.

Thornton, R. J. and Bunker, A. (1989) Characterisation of wine yeasts for genetically modifiable properties. J. Inst. Brew. **95**, pp. 181-184.

Thornton, R. J. (1989) Wine Yeast Research in New Zealand, Australian and New Zealand Wine Industry Journal. **2,** pp. 49-51

Wedlock, D. N. and Thornton, R. J. (1989) Transformation of a glucose negative mutant of *Pachysolen tannophilus* with a plasmid carrying the cloned hexokinase P II gene from *Saccharomyces cerevisiae*. Biotechnol. Lett. **11**, pp. 601-604.

Rodriguez, S. B. and Thornton, R. J. (1988) Rapid utilisation of malic acid by a mutant of *Schizosaccharomyces malidevorans*. Proceedings of the 2nd International Symposium for Cool Climate Viticulture and Oenology. Smart, R. E., Thornton, R. J., Rodriguez, S. B. and Young, J. E. (eds.). Auckland, New Zealand, pp. 313-315.

Thornton, R., & Rodriguez, S. (1988). *Commercial scale deacidification of grape juice for wine making by Schizosaccharomyces malidevorans mutant 11*. Proceedings of seminar, Innovations in viticulture and oenology, held at Solway Park Hotel, Masterton, Thursday, October 20, 1988. Auckland, N.Z.: New Zealand Society for Viticulture and Oenology

Rodriguez, S. B., Amberg, E., Arnink, K. J., Thornton, R. J. and McLellan, M.R. (1988) Complexity in Chardonnay wines: effects of malo-lactic fermentation and barrel fermentation. Proceedings of the 2nd International Symposium for Cool Climate Viticulture and Oenology. Smart, R.E., Thornton, R.J., Rodriguez, S.B., and Young, J.E.(eds.). Auckland, New Zealand. p. 287.

Thornton, R. J., Wedlock, D. N. and Clark, T. A. (1988) Genetic improvement of the xylose-fermenting yeast *Pachysolen tannophilus*: a summary of the New Zealand programme. A report to the International Energy Agency/Bioenergy Agreement. Forest Research Institute/Ministry of Forestry/Massey University. 15 pp.

Ravji, R. G., Rodriguez, S. B. and Thornton, R. J. (1988) Glycerol production by four common grape moulds. Am. J. Enol. Vitic. **39**. pp. 77-82.

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Thornton, R. J. and Eustace, R. E. (1987) Selective hybridisation of wine yeasts for higher yields of glycerol. Can. J. Microbiol. **33**, pp. 112-117.

Thornton, R. J. (1987) Wine yeast research in New Zealand. Australian and NZ Wine Industry Journal **2**, pp. 49-50.

Thornton, R. J. (1986) Genetic characterisation of New Zealand and Australian wine yeasts. Antonie van Leeuwen. **52**, pp. 97-103.

Thornton, R. J., Clarke, T., Wedlock, D. N., James, A. P. and Deverall, K. (1986) Strain improvement of the xylose-fermenting yeast *Pachysolen tannophilus* by hybridisation of two mutant strains. Biotechnol. Lett. **8**, pp. 801-806.

Thornton, R. J. and Rodriguez, S. B. (1986) Genetics of wine microorganisms : potentials and problems. Proceedings of the VIth Australian Wine Industry Technical Conference. T. Lee (ed.) pp. 98-102.

Thornton, R. J. (1986) Wine yeast culture, propagation and evolution. Proceedings of the Cornell University Symposium on Winemaking, pp. 9-27.

Thornton, R. J. (1985) The improvement of desirable winemaking characteristics in wine yeasts by hybridisation. In the International Symposium on Cool Climate Viticulture and Enology. Heatherbell, D.A., Lombard, P.B., Bodyfelt, F.W. and Price, S.F. (Eds.). Eugene, Oregon, Oregon State University, pp. 446-459. OSU Agricultural Experiment station Technical Publication #7628

Thornton, R. J., James, A. P. and Wedlock, D. N. (1985) Strain improvement of *Pachysolen tannophilus* by genetic techniques for its use in the production of liquid fuel by the fermentation of wood hydrolysates. Proceedings of MicroBiotech '85. Conference, Massey University.

Thornton, R. J. (1985) The introduction of flocculation into a homothallic wine yeast, a practical example of the modification of winemaking properties by the use of genetic techniques. Am. J. Enol. Vitic. **36**, pp. 47-49.

Thornton, R. J. (1984) Selecting yeast strains for winemaking. Proceedings of Vintage '84 - Seminar. Te Kauwhata Research Station Oenological and Viticultural Bulletin **43**, pp. 1-14.

Thornton, R. J. (1983) New yeast strains from old - the application of genetics to wine yeasts. Food Technol. Australia **35**, pp. 46-50.

Thornton, R .J. (1983) Use of genetic techniques to enhance the winemaking properties of yeasts. Australian Grapegrower Winemaker p. 32.

Thornton, R. J. (1982) Selective hybridisation of pure culture wine yeasts II. Improvement of fermentation efficiency and inheritance of SO_2 tolerance. European J. Appl. Microbiol. **14**, pp. 159-164.

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Haylock, S. J., Thornton, R. J., Buckley, P. D. and Blackwell, L. F. (1982) Effect of chromium on the rate of carbon dioxide evolution from *Saccharomyces cerevisiae*. Expt. Mycology **6**, pp. 335-344.

Thornton, R. J. and Eschenbruch, R. (1981) Homothallie einer schwach und einer stark sulfitbildenden weinhefe. Die Wein-Wissenschraft **3**, pp. 181-182.

Thornton, R. J. (1981) Transfer of genetic information in yeasts. In "An introduction to genetic information transfer." Palmerston North Biotechnology Department, Massey University, 1981. Proceedings of the 13th Biotechnology Conference, pp. 1-22.

Thornton, R. J. (1980) Genetic investigation and modification of wine yeast characteristics. Grape and Wine Centennial Symposium Proceedings. June 1980, Davis, CA., University of California Press, pp. 97-102.

Thornton, R. J. (1978) The mapping of two dominant genes for foaming in wine yeasts. FEMS Microbiol. Lett. **4**, pp. 207-209.

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Thornton, R. J. & Eschenbruch, R. (1976) Homothallism in wine yeasts. Antonie van Leeuwenhoek **42**, pp. 503-9

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Thornton, R. J., Law, E. and Johnston, J. R. (1969) Genetics of population changes during continuous culture of *Saccharomyces cerevisiae*. Antonie van Leeuwenhoek J. Microbiol. Serol. **35**, p. 9.

Books

Rodriguez, S.B. and Thornton, R.J. (eds) (2011) 2nd International Wine Microbiology Symposium Proceedings, Tenaya Lodge, Yosemite, California State University, Fresno. March 29 - 30. 194 pages

Thornton, R.J., ***Rodriguez, S. B., and Fugelsang, K. C (eds.).*** **2006** International Wine Microbiology Symposium Proceedings, Tenaya Lodge, Yosemite, California State University, Fresno.

Smart, R. E., Thornton, R. J., Rodriguez, S. B. and Young, J. E. (eds.). **1988** Proceedings of the 2nd International Symposium for Cool Climate Viticulture and Oenology. Auckland, New Zealand, ISBN 0-9597864-6 634.8.

Book chapter

Linda Bisson, Roy Thornton, Peter Gago (2004), ***The Business of Enology*** in WINE, A Global Business, Liz Thach & Tim Martz (eds) Miranda Press, Elmsford, New York

Thornton, R.J. (1987) An introduction to the genetics of industrial yeasts. *In* Industrial Yeast Genetics. Foundation for Biotechnical and Industrial Fermentation Research. Korhola, M., and Nevalainen (eds.). Helsinki, Finland **5**, pp. 11-25.

Research grants

S. B. Rodriguez, R. J. Thornton. Early detection of grape trunk disease by Raman spectroscopy. CSU Agriculture Research Institute (ARI) 2014 – 2015 **$23,437**

R. J. Thornton, S. B Rodriguez, Quantification of microbial rot in wine grapes AVF (2014-5) **$68,102**

R. J. Thornton, S. B Rodriguez, Development of an FTIR-based 'field calibration' for wine grape rot quantification ARI 2013 – 2014 **$74,712**

R. J. Thornton, S. B Rodriguez, Quantification of microbial rot in wine grapes AVF (2013-4) **$92,457**

S.B. Rodriguez and R.J. Thornton Raman spectroscopy and microbial identification. American Vineyard Foundation #1129 (2011-2012) **$22,033**

S.B. Rodriguez and R.J. Thornton; Identification of wine yeast & bacteria by Raman spectroscopy CSU Agriculture Research Institute #12-2-014 – (2011-2012) **$22,033**

R. J. Thornton, S. B Rodriguez, G.Takeoka, E. Person, R. Wample Quantification of rot in wine grapes
ARI – (2009 -2012) **$288,692**
R. J. Thornton, S. B Rodriguez, E. Person, R. Wample Quantification of rot in wine grapes
ARI – Federal Fund (2009) **$99,823**
R. J. Thornton, S. B Rodriguez, Quantification of Microbial Rot in Grapes.
American Vineyard Foundation (2008 - 2012) **$487, 492**
R. J. Thornton, S. B Rodriguez,
The influence of *Saccharomyces cerevisiae* and *Saccharomyces bayanus* yeast strains on color enhancement and color stability in the vinification of Cabernet Sauvignon grapes from the San Joaquin Valley.
American Vineyard Foundation (2008 – 2010) **$75,000**
SB Rodriguez, & R. J. Thornton Evaluation of wine yeast strains for color enhancement, color stability and flavor in Cabernet Sauvignon and Zinfandel grapes grown in the San Joaquin Valley.
CATI – ARI (2007– 2009) **$44,750**
R. J. Thornton, S. B Rodriguez, K. C. Fugelsang, B. H. Gump Selective hybridization of wine yeast strains to enhance the production of flavor/active thiol compounds in Sauvignon Blanc wines**.** ARI (2005-7) **$70,510**
R. J. Thornton, S. B Rodriguez, K. C. Fugelsang, B. H. Gump
Detection, enumeration, viability and vitality of strains of *Lactobacillus* and *Pediococcus* in wine.
California Competitive grant Program for Research in Viticulture & Enology(2005 – 2006) **$25,000**
R. J. Thornton, S. B Rodriguez, K. C. Fugelsang, B. H. Gump *Identification, enumeration, viability and metabolic activity of yeasts and bacteria during winemaking and wine processing.*
CATI – ARI campus grant (2005 – 2006) **$28,900**
R. J. Thornton, S. B Rodriguez, K. C. Fugelsang, B. H. Gump. Characterization of the growth of strains of *Oenococcus oeni* in the presence of *Saccharomyces cerevisiae* in real time during winemaking (2004 – 2005)
American Vineyard Foundation **$10,000**
Characterization of the growth and flavor potential of strains of *Oenococcus oeni* in red and white winemaking (2003 - 2004) California Competitive grant Program for Research in Viticulture & Enology **$10,000**
R. Wample, D. Schulteis, G. Wraith, R. J. Thornton, S. B. Rodriguez, Commercializing a New Raisin Product: California Golden Sun Dried Raisins "Buy California Initiative" Specialty Crop Grant **$46,700**
K.C. Fugelsang, R.J. Thornton and B.H. Gump. *Impact of Yeast Strain and Copper addition on Ethyl Carbamate Formation in Sherry* Wine Institute (2003) **$30,212**
R. J. Thornton, S. B Rodriguez, K. C. Fugelsang, B. H. Gump *Identification, enumeration, viability and metabolic activity of yeasts and bacteria during winemaking and wine processing.* ARI campus grant (2004-5) **$19,400**
R. J. Thornton, S. B Rodriguez, K. C. Fugelsang, B. H. Gump
Effect of vine root aeration on raisin productivity "Buy California Initiative" Specialty Crop Grants **$73,078**
R. J. Thornton, S. B Rodriguez, K. C. Fugelsang, B. H. Gump Evaluation of factors affecting the occurrence of sluggish or stuck high–density wine fermentations. "Buy California Initiative" Specialty Crop Grants **$129,800**
R. J. Thornton, S. B Rodriguez, K. C. Fugelsang, B. H. Gump. Characterization of the flavor spoilage potential of different strains of *Dekkera/Brettanomyces* "Buy California Initiative" Specialty Crop Grants **$110,500**
S. B. Rodriguez, R.J. Thornton *Investigation of technologies for rapid determination of mold in dried figs* **$29,636**
American Vineyard Foundation and California Competitive Grant Program for Research in Viticulture & Enology
Characterization of the growth and flavor potential of strains of Oenococcus oeni in red and white wine **$20,000**
S. B. Rodriguez, R.J. Thornton Determination of timing of oleate raisin spraying
Raisin Advisory Commission (2002) **$10,000**
Wine Institute (2001) Reduction of ethyl carbamate precursors in wine **$20,728**
ARI –CATI (2001-3) Reduction of urea in wine **$17,000**
ARI-CATI (2002-3) Micro-oxygenation of Red Wines **$7,935**
California Lottery funds (2002) Faculty Development proposal **$2,500**
American Vineyard Foundation (2002) for Winescan FTIR spectrometer **$65,000**

Donations

Wente Bros Winery (2005) Automated Enzymatic analyzer	**$80,000**
E & J Gallo Winery (2004) Biolog microplate reader, PCR,	**$50,000**
Duarte Vineyards (2004) 30 tons Cabernet sauvignon grapes	**$15,000**
Duarte Vineyards (2003) 30 tons Shiraz grapes	**$15,000**
FOSS NorthAmerica (2002) software for Winescan FTIR Spectrometer	**$35,000**
Community Hospitals (2002) FASCAN flow cytometer	**$20,000**
Total	**$285,000**

August 2014