



Position Description

Title of Position: Research Scientist/Senior Research Scientist

Reporting to: Research Manager - Chemistry

Overview: The Research Scientist/Senior Research Scientist will work as part of a team focused on understanding factors affecting wine texture, taste, clarity, stability and production efficiency. The overall objective is to provide the required knowledge and tools to allow winemakers to more objectively manage winemaking processes through improving the knowledge of macromolecules in grapes and wine and an enhanced understanding of the impact of winemaking processes on the interactions between macromolecules and colloids.

Specifically the research will investigate:

- the compositional drivers for texture, hotness and bitterness;
- the role of macromolecules such as tannins, polysaccharides, proteins and their aggregate colloids in the expression of texture, stability, clarity and filterability;
- the impact of other wine matrix components on macromolecule function and expression;
- the source of these molecules or their precursors in grapes and yeast and the impact of winemaking processes such as clarification, flotation, vinification and filtration on their retention and/or transformation;
- the impact of filtration on macromolecules;
- alternative strategies for achieving protein stability;
- practical methods for wineries to determine likely extractability of macromolecules during winemaking; and
- strategies for the stabilisation of colour independent of vintage effects.

The position will require the adaptation and development of analytical methods for characterising colloids and their interactions, kinetics and their implications for wine. The Research Scientist/Senior Research Scientist will be required to apply these methods to the areas described above, working on some aspects individually and other aspects collaboratively with other team members. The position is located at the Australian Wine Research Institute (AWRI), at the Waite Research Precinct, Adelaide, South Australia.

Qualifications:

A PhD or equivalent experience in chemistry (physical, organic, natural product, food), chemical engineering, or food science and technology is essential; relevant postdoctoral research experience is required, and experience in wine science, winemaking or other relevant fields is desirable.

Experience:

Ideally the candidate will have a strong research record demonstrated by their publications, and practical experience with isolation and characterisation techniques for natural macromolecular products such as tannins, polysaccharides and proteins.

Experience in characterising macromolecular interactions and colloidal phenomena in aqueous liquids is highly desirable. For example:

- understanding of kinetic and thermodynamic aspects of macromolecular interactions
- demonstrated experience with studying macromolecular interactions in liquid phases
- knowledge of analytical techniques and mathematical modelling for colloidal phenomena

- understanding of the physical principles of protein, polysaccharide and polyphenol structure and function
- expertise with macromolecules in beverages
- experience with determining particle characteristics in solution using a range of instrumentation such as SAXS (small angle x-ray scattering), ITC (isothermal titration calorimetry), DLS (dynamic light scattering, zeta potential measurements)

Principal Accountabilities:

1. Undertakes applied and strategic research on the physical chemistry of wine macromolecules and colloidal phenomena that affect wine texture, taste, clarity, stability and production efficiency.
2. As part of the team, actively contributes to the planning, execution and completion of research projects within designated project parameters.
3. Actively contributes to and critically appraises the analysis of data generated by the project team.
4. Actively contributes to and critically appraises the reporting and dissemination of research progress and outcomes through regular reports, refereed and industry publications, and seminars and workshops to a standard expected of AWRI presentations and publications.
5. Regularly searches, reviews and reports on emerging literature, identifying developments in chemistry that could be of benefit to industry and advises on the direction of research.
6. Using best practice, records on a daily basis all activities, details of any experimental work and outcomes of data processing and interpretation.
7. Accepts that all Intellectual Property, Patents and discovery arising during the course of employment at the AWRI remain the property of the AWRI.
8. Undertakes other duties as directed by the Research Manager, Group Manager or Managing Director.
9. Promotes the general well-being of the AWRI by ensuring that all contact with clients, staff or the public is performed in a professional and confidential manner.

Person Specification:

1. Practical understanding of and demonstrated experience in initiating, executing and successfully completing scientific research.
2. Ability to work and communicate successfully within a multi disciplinary environment and across research and industry groups.
3. Ability to influence, lead and drive outcomes.
4. Ability to maintain effective working relationships and contribute positively in a team environment.
5. Superior oral and written communication skills.

Occupational Health Safety Welfare and Environment Responsibilities:

Employees and students must take reasonable care to protect their own health and safety, and have responsibilities to:

1. ensure that they do not increase the risk to the health, safety or welfare of others through any act or omission;
2. obey reasonable instructions that are designed to protect their health, safety and welfare;
3. use, in the appropriate manner, equipment that is provided to protect their health, safety or welfare.
4. not wilfully interfere with, or misuse, items or facilities provided in the interest of health, safety or welfare of employees;

5. ensure that they are not affected by alcohol or any other drug to such an extent that they endanger themselves or others; and
6. report promptly, any hazards, incidents or injuries to their Manager/Team Leader.