

# Analytical strategies for the measurement of the shelf life of wines

University of Bordeaux



**NICOLAS BAUDIN**  
INTERNSHIPS IN FRANCE INITIATIVE

Name of the hosting institution in France	University of Bordeaux
Name of the host laboratory / research team	Research unit in Enology
Address	ISVV, 210 chemin de leysotte 33405 villenave d'ornon
Website	<a href="https://www.isvv.u-bordeaux.fr/fr/oenologie.html">https://www.isvv.u-bordeaux.fr/fr/oenologie.html</a>
Name of the supervisor	Alexandre PONS
Function	Researcher
Email	alexandre.pons@u-bordeaux.fr

## Internship offer

Topic of the internship (title)	Analytical strategies for the measurement of the shelf life of wines			
Proposed dates of the internship*	<b>Start</b>	2026-09-01	<b>End</b>	2021-01-29

\* The supervisors have indicated the dates proposed are flexible and are able to be postponed subject to COVID-19 border closures.

### Scientific and academic objectives of the internship (detailed description of the internship content, work expected from the intern and expected outcomes):

The composition of wines evolves with exposure to oxygen during both barrel and bottle aging. The aroma can be altered through such oxidation, ultimately impacting wine quality. Oxidative changes in wine aroma can be positive or negative, depending on the compounds produced (or degraded), their concentrations, and their sensory threshold in wine. In wines, oxidation mechanisms involve reactive oxygen species (ROS) formation, yielding strong modifications of the chemical composition as well as the flavour of the wine. For example, it has been recently found that an important aroma compound found at trace level (sub  $\mu\text{g/L}$ ); 3-methyl-2,4-nonanedione, came from fatty acids oxidation. Thus, knowledge of fatty acid composition of wines, i.e. the amount of aromatic precursors, could contribute to the understanding of wine aroma degradation kinetics during aging. For that, fatty acid analysis will be performed in many young and old wines thanks to gas chromatography coupled with tandem mass spectrometry. Based on these results, applications relative to the study of wood addition on wine aroma stability and chemical composition will be envisioned. In addition, study of the wine ability to resist an oxidation stress will be studied thanks to electron paramagnetic approach. This project follows a previous internship project dealing with the evaluation of EPR (electron paramagnetic resonance) as a tool to evaluate the sensitivity of wines to oxygen. So, in addition, the student will be in charge of analysing the ability of wine to produce free radicals thanks to this analytical approach. The final goal is to develop a new procedure to evaluate the ability of a wine to age a long time or not.

Name of industrial partner	Seguin Moreau
Role of the industrial partner in the internship project	The industrial partner is interested in studying the effect of oxygen released during barrel aging on the flavour of wines. The partner will provide several wine samples from several vineyards and oak wood samples
Main contact at the French industrial partner	Andrei Prida
Email	andrei.prida@seguin-moreau.fr

## Expected profile of applicant

Level of study	Master (Year 2)
Discipline	Food chemistry, analytical chemistry, biochemistry
Required qualities, knowledge and skills	Good laboratory practices; Excellent written and verbal communication skills, including the ability to write clear, concise reports; Basic analytical chemistry skills including HPLC and GC-MS. Some personal interests in wine tasting.