# Clarification of cognac ageing secrets thanks to FTICRMS

Valentine Chevillon*[1] and Hugues Preud'homme[1]

[1]IPREM – CNRS, Université de Pau et des Pays de l'Adour [UPPA] – France

**Résumé**

Crafted through the double distillation of white wine and meticulously aged in oak barrels, cognac undergoes a vital maturation where the eau-de-vie interacts with the wood, extracting various aromatic molecules. This process unveils its rich bouquet, elevating it to a level of exceptional excellence. For that, we can play with three ingredients: eau-de-vie, wood, and time. The goal of this work is to characterize some wood molecules that can explain how we mix these ingredients during the ageing. However, wood is known to be a complex matrix with a rich variable composition and a lot of isomers. To overcome this challenge, we use UPLC-timsTOF and FTICRMS in synergy to tackle the complexity of these hydroalcoholic mixtures. We are expecting to be able to decipher the evolution of the flavor during its maturation through the identification of a few molecules of interest (markers). On the one hand, UPLC-timsTOF is employed for high-throughput analysis of a large, statistically significant batch of samples, facilitating a robust untargeted metabolomic approach. The benefit of ion mobility is the separation of isobars, which provides valuable structural information for compound identification. On the other hand, by directly infusing the raw material into the FTICRMS 12T, we have access to the ultrafine isotopic structure and ppb mass accuracy. This allows us to propose an unambiguous chemical formula, significantly reducing the number of potential molecules for each exact mass. Ultimately, after combining all this data, we aim to retrace centuries of cognac history, revealing the secret of these complex and exceptional natural products. This breakthrough will be critical as we confront the challenges of climate change and environmental alteration which could compromise the organoleptic properties and the unique character of this luxury spirit.

**Mots-Clés:** wood molecules, ageing, complex mixture

*Intervenant