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TOPIC(s) : Chemical engineering

Molecules of Biological Interest, UR Enology, University of Bordeaux and Polyphenols Biotech (Technology transfer unit)

AUTHORS

Stéphanie CLUZET / UNIVERSITY OF BORDEAUX, ISVV, 210 CHEMIN DE LEYSOTTE, VILLENAVE D'ORNON

Caroline ROUGER / UNIVERSITY OF BORDEAUX, ISVV,, 210 CHEMIN DE LEYSOTTE, VILLENAVE D'ORNON

PURPOSE OF THE ABSTRACT

The research activities of the MIB (Molécules d'Intérêt Biologique) group are organized along three main axes:

- Analysis of grapevine and wine polyphenols:

We characterize different families of polyphenols from grapevine and wine like anthocyanins, flavanols, flavonols, or specially- stilbenes. We use mainly Centrifugal Partition Chromatography (CPC) and Liquid Chromatography, frequently hyphenated with Mass Spectrometry and NMR. We also evaluate the feasibility of using the stilbenes as markers of wine authenticity by ¹H NMR.

- Study of these compounds in relation to the defence of grapevine towards diseases

We are interested in 2 methods aimed to control plant pathogens:

- stimulation of the plant natural defence mechanisms by using elicitor molecules. The effects on the plant (especially grapevine) are measured by transcriptomics and metabolomics, particularly in relation to the polyphenols (including the stilbenes).

- utilisation of natural compounds with antimicrobial activities. We provide major interest to the polyphenols (stilbenes) obtained from agricultural by-products. We analyze their biological activity against certain plant diseases (e.g. mildew, grey rot). The impact of such treatments on the plant physiology is evaluated.

We have grape cellular cultures, that we can use as simple plant model to i) infer the signal pathways and understand the action mechanisms of environmental factors (nitrogen, phytohormones, elicitors) and ii) produce biotechnologically polyphenols of interest.

- Impact of these compounds on Human Health

We are interested in the biological activities of the native molecules from the plant and the wine, but also in the bioactivities of their circulating forms (metabolites which can be produced by hemisynthesis). We aim to evaluate the antioxidant, antiinflammatory and cytoprotective activity of stilbenes in in vitro experiments using cellular cultures, as well as the study of the polyphenols/biomolecules interaction by NMR.

-> Technology transfer unit:

- Consulting work for product development, including facilitation with publications and patents
- Supply high-quality, reproducible, polyphenol-enriched plant extracts
- Provide a wide-range of plant-derived polyphenolic standards
- Biological and chemical characterization of crude plant extracts
 - Individual and total polyphenol quantification using spectrophotometric (Folin, Bate-Smith, Porter, Eur. Pharm., BL-DMAC) and chromatographic techniques such as HPLC (polyphenolic profiles)
- Structure determination of biologically active compounds (MS, NMR)
- Antioxidant activity measurements (ORAC, DPPH, TEAC and CAA)
- Bioavailability studies (colon and skin bioavailability models)
- Antimicrobial assays (plant pathogens)

FIGURES

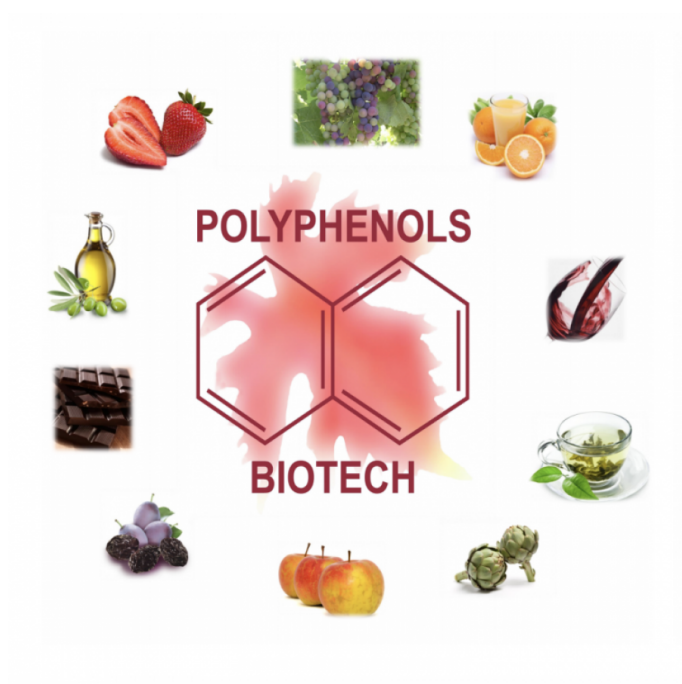


FIGURE 1

FIGURE 1.

Logo Technolgy transfer unit

Polyphenols Biotech - Bordeaux

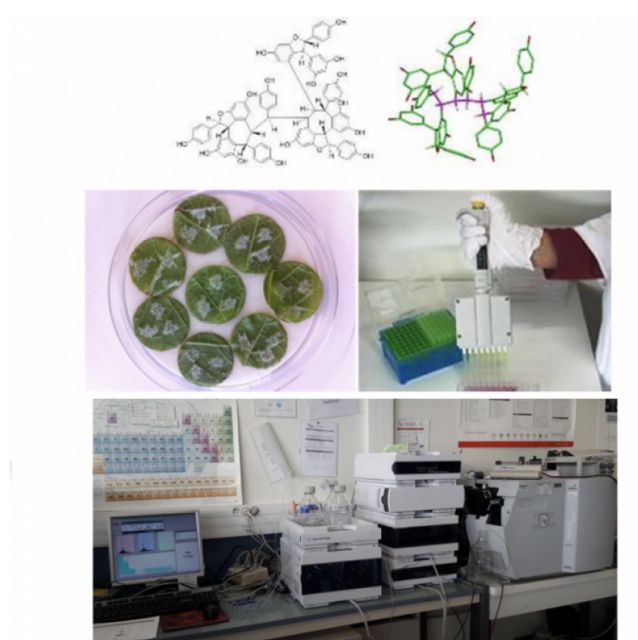


FIGURE 2

FIGURE 2.

MIB laboratory

Molecules of Biological Interest

KEYWORDS

BIBLIOGRAPHY