

# PlantLipPol-Green: a new powerful tool for plant molecules characterization



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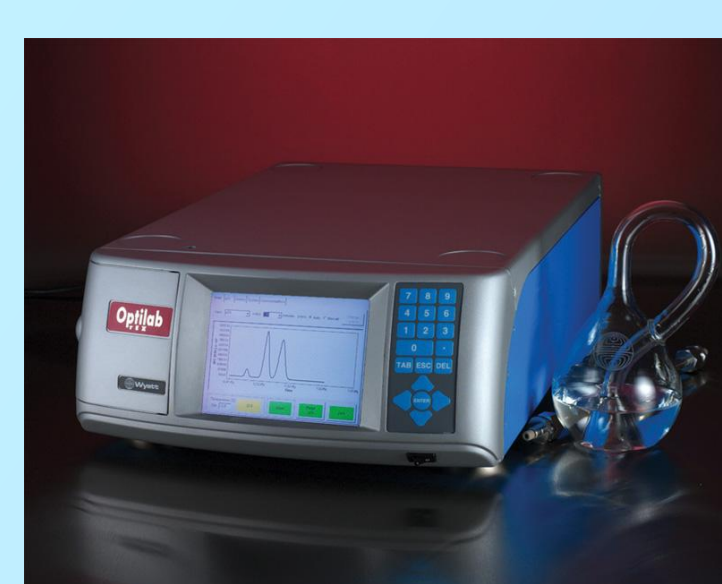
A new structuring scientific platform, based in Montpellier SupAgro place is emerging. It has been developed for the characterization of plant lipids and hydrophobic polymers for a green and sustainable chemistry. This platform, financed by the Advanced Research Thematic Network (RTRA), Agropolis Fondation, is mainly based on two analytical chains: a comprehensive Gas Chromatograph coupled to a Mass Spectrometer (GCxGC-MS) and an Asymmetrical Flow Field Flow Fractionation (A4F) on-line coupled with a Multi Angle Laser Light Scattering (MALLS), a Differential Refractive Index Detector (DRI) and an Inductively Coupled Plasma Mass Spectrometer (ICP-MS).

## ANALYTICAL TOOLS

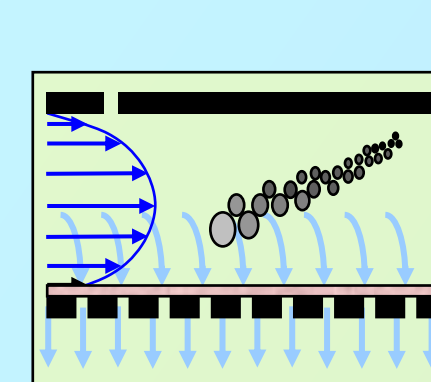
A4F - MALLS  
(Postnova / Brookhaven)



DRI  
(Wyatt Technology Corporation)

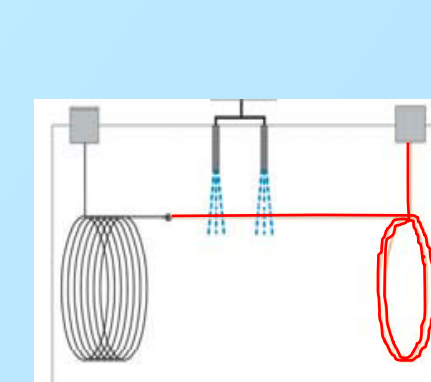


ICP-MS  
(Thermo Fischer Scientific)

A4F is based on a liquid flow field in a semi-permeable channel. Because of the parabolic main flow profile, the macromolecules are size-separated (from the smaller to the larger ones). MALLS associated to DRI detector permits to determine size and mass of analyzed macromolecules although ICP-MS allows to monitor elements associated (constitutive or linked).

GCxGC -MS  
(Thermo Fischer Scientific)

Comprehensive GCxGC is a powerful technique emerging as a method of choice for analysis of complex lipids mixtures. The separation based on two orthogonal columns presents the advantage to permit extremely sensitive analyzes and obtain fast and detailed results from complex samples. MS detector allows to identify easily the analytes during the separation.

Comprehensive GCxGC-MS is actually well adapted for analyses of lipids mixtures such as fatty acid isomers and oxidation derivatives

## THE PLATFORM

### Additional equipments

The platform is located at Montpellier SupAgro in the South of France. Additionally to the dedicated analytical tools, the platform, benefits from the competences and the instruments of UMR IATE (Agropolymer Engineering and Emerging Technologies - Microbiological and Enzymatic Biotechnology of Lipids and Agropolymers team) hosting group :

#### •Extraction methodologies:

Classical systems, Accelerated Solvent Extraction System (ASE 200)

#### •Analytical techniques:

FID / MS  
HPLC - UV / RI / ELSD / ESI / APCi - MS  
IATROSCAN - FID / PFPD  
TLC - FID  
SEC - UV - MALLS

A scientific committee will evaluate platform activity, quality and coherence of the scientific projects with the platform objectives.

Today, 14 international teams gather around the platform :



•UMR Agropolymer Engineering and Emerging Technologies, Montpellier, FRANCE



•UMR Science for Oenology, Montpellier, FRANCE



•UMR Diversity and Adaptation of Cultivated Crops, Montpellier, FRANCE



•UMR Biochemistry and Plant Molecular Physiology, Montpellier, FRANCE



•Charles Gerhardt Institute, Montpellier, FRANCE



•UPR Biomass-Energy, CIRAD, Montpellier, FRANCE



•Indian Institute of Technology, Dept. of Agricultural and Food Engineering, Kharagpur, INDIA

•University of Massachusetts, Dept. of Food Science, USA

•Technical University of Lisbon, Dept. of Agro-Industry and Tropical Agronomy, PORTUGAL

•Kasetsart University, Agricultural and Agro-industrial Product Improvement Institute, THAILAND

•Prince of Songkhla University, Dept. of Polymer Science and Faculty of Science and Industrial Technology, THAILAND

•University of the Republic, Laboratory of fats, oils and compatible Products, Montevideo, URUGUAY

•Federal University of Paraná, Enzyme Technology and Biocatalysis Laboratory, BRAZIL

•Rio de Janeiro State University, Polymers group, BRAZIL

### Collaborations

Currently, 18 projects, linking **international research teams** and **industrial companies**, are associated to the platform. These projects could be classified into three categories :

1. Profiling and screening of molecular biodiversity of plant biomass.
2. Study of molecular determinants of the quality of raw and processed plant products.
3. Development and optimization of green processes for the transformation of plant biomass.



The main goals of this platform are to :

- foster synergies between scientific teams in the fields of plant sciences, bioprocesses and chemistry,
- foster international partnerships with both academic and industrial research teams in the framework of green and sustainable chemistry,
- contribute to education programs.

Proposition of projects are welcome and will be carefully examined !!!!