# E20 - AXIOM Platform
Leader : Laurent Debrauwer

Analytical methods and services for the study of food contaminants, their fate and their effects

✓Analysis, structural identification, and synthesis of metabolites of xenobiotics and endocrine disruptors.
✓Quantitative determination of food contaminants, metabolites or biomarkers at the trace level in complex matrices.
✓Untargeted metabolomics studies by high resolution mass spectrometry and NMR of biological samples.
✓Spectrometric data generation and treatment for the modeling of metabolic networks.
✓NMR fingerprinting of biological fluids or tissular extracts and associated statistical data analyses proposed as a complete service.
✓Training and access to instruments opened to the scientific community.
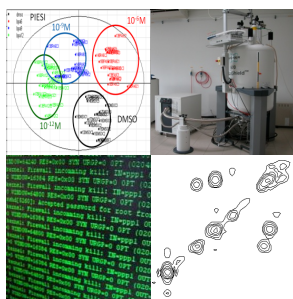
Research & Developments :

- **Metabolomics:** integrated NMR–MS platform for enlarging and enriching metabolomic data in the frame of studies aimed at characterizing the impact of contaminants on global metabolism and metabolic networks.
- **Aldehydomics:** innovative targeted metabolomics approaches for tracking oxidative stress markers.
- **Adductomics:** development of leading edge analytical methodologies for the characterization of macromolecule modifications (protein or DNA) by reactive xenobiotic metabolites as markers of exposure and /or toxicity.
- **Lipidomics:** global analysis of lipids in biological samples by NMR.
- **Xeno-metabolomics** : non targeted multi-residue detection of contaminant / metabolites mixtures (exposomics).
- **Metabolism:** development of analytical tools to study metabolites of food contaminants and endocrine disruptors.

Recent publications :

- **Lacroix M**, Puel S, Collet S, Corbela T, Picard-Hagen N, Toutain PL, Viguié C, Gayrard V. Simultaneous quantification of bisphenol A and its glucuronide metabolite in plasma and urine: Applicability to toxicokinetic investigations, **Talanta**, **2011**, 85, 2053-2059
- **Jouanin I**, Baradat M, Gieules M, Taché S, Pierre F, Guéraud F, **Debrauwer L.** LC/ESIMS tracking of 4-HNE biotransformations by mouse colon epithelial cells using [1,2-$^{13}C_2$]-4-HNE as stable isotope tracer, **Rapid Commun. Mass Spectrom**, **2011**, 25, 2675-2681.
- Martin JC, **Canlet C**, Delplanque B, Agnanie G, Lairon D, Gottardi G, Bencharif K, Gripoise D, Thaminy A, Paris A. ^{1}H NMR metabonomics can differentiate the early atherogenic effect of dairy products in hyperlipidemic hamsters, **Atherosclerosis**, **2009**, 206, 127-133.
- Jourdan F, Cottret L, Huc L, Wildridge D, Scheltema R, Hillenweck A, Barrett M, Zalko D, Watson D, **Debrauwer L.** Use of reconstituted metabolic networks to assist in metabolomic data visualization and mining. **Metabolomics, 2010**, 6, 312-321.
- Jacques C, **Jamin E**, Perdu E, Duplan H, Mavon A, Zalko D, **Debrauwer L**. Characterisation of B(a)P metabolites formed in an ex vivo pig skin model using three complementary analytical methods. **Anal. Bioanal. Chem.**, **2010**, 396, 1691-1701.
- Kondjoyan A, **Chevolleau S**, Grève E, Gatellier P, Santé V, **Bruel S, Touzet C**, Portanguen S, **Debrauwer L.** Modelling of the formation of HAs in slices of *longissimus thoracis* and *semi membran.* beef muscles subjected to jets of hot air. **Food Chem.,** **2010**, 123, 659-668.
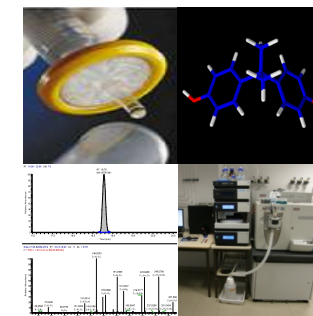
Collaborations : LABERCA (Nantes), ICSN-CNRS (Gif-sur-Yvette), EI-Purpan (Toulouse), Univ. P & M Curie (Paris), INRA-Theix.

Permanent staff : L. Debrauwer (IR1 INRA, group leader, Mass Spectrometry), C. Canlet (IR2 INRA, NMR), S. Chevolleau (IE1 INRA, Analytical chemistry), G. Delous (AI INRA, Analytical chemistry), E. Jamin (IR2 INRA, Mass Spectrometry), I. Jouanin (IE2 INRA, Organic synthesis), M. Lacroix (IR2 INRA, Mass Spectrometry), J. Molina (TR INRA, Analytical chemistry, NMR), M. Tremblay-Franco (IE 2 INRA, Statistics), R. Dou (IE1 INRA, logistics, quality management).

Last update : Nov. 2011