Tools and Applications in Plant Metabolomics at Bordeaux Metabolome-Fluxome Facility (PMFB; http://www.bordeaux.inra.fr/umr619/NMR.htm)

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Main collaborations: in Japan (Univ. of Tsukuba - C. Matsukura), in Israel (Volcani Center, A. Schaffer; Ben Gourion University, A. Fait), in UK (Univ of Manchester -R. Goodacre and J.W. Allwood; Oxford Univ, Lee Sweetlove; Oxford Brookes Univ, D. Fell) in France (INRA Avignon, M. Causse, M. Génard, JL. Poëssel; INRA Bordeaux, D. Thiéry ; INRA Montpellier, F. Tardieu ; INRA Sophia Antipolis, P. Frendo).

The Bordeaux Metabolome-Fluxome Facility (PMFB) develops and applies plant metabolomics and high-throughput metabolic phenotyping for local, national and international projects. Applications range from the characterization of plant derived extracts to systems biology:

1- Quantitative metabolic profiling of plant organs or tissues by $^1$H-NMR [1, 2, 3, 4],
2- Plant metabolomics by LC-HRMS,
3- Robotised high-throughput measurements of metabolite concentrations and enzyme activities and kinetics [5],
4- Storage of metadata and raw data and biostatistical analysis. A web-based application, “MeRy-B” (for Metabolomics Repository of Bordeaux) is being developed in collaboration with the Bordeaux Bioinformatics Centre (http://www.cbib.u-bordeaux2.fr/MERYB/home/home.php) [6],
5- Identification of metabolic markers for biotic or abiotic environmental changes [7] or agricultural practices [8],
6- Characterization of plant extracts having bioactive properties (JL. Poëssel INRA Avignon and D. Thiery INRA Bordeaux),
7- Characterization of mutants [9] or transformants [10,11] for candidate genes for grain or fruit quality,
8- Screening of genetic resources or offsprings for fruit composition (A. Schaffer, Bet Dagan, Israel and META-PHOR consortium http://www.meta-phor.eu; ISAFRUIT consortium http://www.isafruit.org) or resistance to water stress (F. Tardieu, INRA Montpellier, FP7 DROPS project),
9- Integrative modelling of tomato fruit metabolism (ERASysBio FRIM project),
10- Integration of metabolomics data with other ‘omics data for the study of fleshy fruit development and metabolism [10,12].

In this poster, we will provide an overview of the major features of some of these metabolomics studies and tools developed at Bordeaux.

References:
6 Ferry-Dumazet et al. (2011) BMC Plant Biology in press
10 Garcia et al. (2009) C. R. Biologies 332:1007-21