**PhenoMeNal: A comprehensive and standardised e-infrastructure for analysing medical metabolic phenotype data**

**Introduction**

In the coming decade a significant number of the 500.000.000 European (EU/EEA) citizens will have their genome determined routinely. This will be complemented with much cheaper (currently ~20 Euro per measurement) acquisition of the metabolome of biofluids (e.g. urine, saliva, blood plasma) which will link the genotype with metabolome data that captures the highly dynamic phenome and exposome of patients. Having such low cost solutions will enable, for the first time, the development of a truly personalised and evidence-based medicine founded on hard scientific measurements. The exposome includes the metabolic information resulting from all the external influences on the human organism such as age, behavioural factors like exercise and nutrition or other environmental factors.
Considering that the amount of data generated by molecular phenotyping exceeds the data volume of personal genomes by at least an order of magnitude, the collection of such information will pose dramatic demands on biomedical data management and compute capabilities in Europe. For example, a single typical National Phenome Centre, managing only around 100,000 human samples per year, can generate more than 2 Petabytes of data during this period alone. A scale-up to sizable portions of the European population over time will require data analysis services capable to work on exabyte-scale amounts of biomedical phenotyping data, for which no viable solution exists at the moment.

**PhenoMeNal** is a 3-year EU Horizon 2020 project starting on September 1st 2015 and will develop a standardised e-infrastructure for analysing medical metabolic phenotype data. This comprises development of standards for data exchange, pipelines, computational frameworks and resources for the processing, analysis and information-mining of the massive amount of medical molecular phenotyping and genotyping data that will be generated by metabolomics applications now entering research and clinic.

Dr Fabien Jourdan from INRA TOXALIM, MetaboHub Toulouse will lead INRA efforts in the framework of PhenoMeNal.

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