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PheNoMenal roadmap and needs

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In the coming decade a significant number of the 500.000.000 European citizens will have their genome determined routinely. This will be complemented with much cheaper acquisition of the metabolome of biofluids (urine, blood plasma, cerebrospinal fluid, etc) which will link the genotype with data on the phenome and exposome of patients, which for the first time enables the development of a truly personalised and hand tailored medicine based on hard scientific measurement. The exposome subsumes all the external influences on the human organism such as age, exercise status, nutrition or other environmental influences, which modulate how our organism develops and reacts based on its genetic program. Molecular Phenotyping data, in conjunction with personal genomes generated
for the majority of the population will, on the one hand, be the key to develop a truly personalized medicine, which takes into account individual genomics, lifestyle, exercise status and nutrition of European citizens. On the other hand it will pose dramatic demands on data management and compute capabilities in Europe, as the amount of data generated by molecular phenotyping exceeds the data volume of personal genomes by an order of magnitude.

The PhenoMeNal project will develop and deploy an integrated, secure, permanent, on demand service-driven, privacy-compliant and sustainable e-Infrastructure 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. This einfrastructure will support the data processing of molecular phenotype data from the earliest time point of data acquisition in the laboratory up to the high level medical and biological conclusions.

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