# Clinical metabolomics and pharmacometabolomics to enable personalized medicine

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Clinical metabolomics, i.e., the comprehensive measurement of metabolite intermediates and end-products present in patient-derived samples has gained much attention in the last decade to support the discovery of new biomarkers, aiming for improved diseased diagnosis and prognosis, better understanding of underlying pathophysiological mechanisms, and individualization of therapies. The latter represents an essential challenge in drug development and discovery, where the "one-size-fits-all" paradigm is considered no longer valid and has seen a significant shift towards personalized health care and tailored medical treatments. Pharmacometabolomics, which involves the determination of individual metabolic states including influences from genetics, environment and gut microbiome, is expected to play a crucial role in personalized medicine, by providing comprehensive metabolite signatures upon drug exposure, increased probability of successful selection of drug candidates, better understanding in biomolecular mechanisms, as well as adequate patients subclassifications for inclusion in clinical trials.
Combining (pharmaco)metabolomics with other omics strategies, such as genomics and transcriptomics, will also allow for a better understanding of the biomolecular mechanisms of diseases, for instance neurodegenerative disorders such as Alzheimer's disease, which still remains poorly understood despite the growing number of affected people.