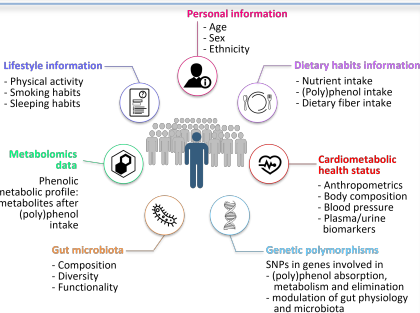
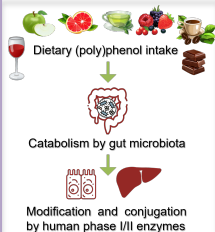


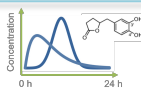
INTRODUCTION

The beneficial effects of plant-based diets can be attributed in part to **(poly)phenols**, which are the main class of phytochemicals. Their role in **cardiometabolic protection** has not been demonstrated consistently because of the heterogeneity in the physiological response to their consumption. This **inter-individual variability** mainly originates from differences in (poly)phenol bioavailability and **metabolism**, which are determined by individual characteristics and result in differences in the qualitative and/or quantitative production and urinary excretion of phenolic metabolites. **The different catabolite production patterns are related to the existence of metabolic phenotypes (aka metabotypes).** Metabotyping (grouping individuals with similar metabolic profiles) may pave the way forward in terms of personalized nutrition.

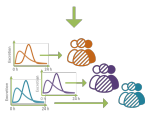


OBJECTIVES

This PhD work aims to investigate the inter-individual variability in (poly)phenol **bioavailability and metabolism**, in order to identify metabotypes in the production and urinary excretion of phenolic metabolites. Metabotypes will be then associated with **individual characteristics**.



Metabolite analysis in urine/plasma with LC-MS metabolomics



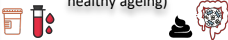
Identification of phenolic metabolites with statistical methods

MATERIALS AND METHODS

Three projects will be dealt with. Each project includes an acute or chronic intervention study, followed by **nutrimental analysis** and a **metabotyping** approach. Vegetable extracts or powders will be used as (poly)phenol sources. Urine and plasma samples will be analysed by high-performance **liquid chromatography coupled with mass spectrometry** to identify and quantify phenolic metabolites. **Statistical methods** will be applied to identify phenolic metabotypes and assess the relationship between metabotypes and individual characteristics.

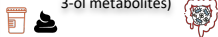
PROJECT 1

COMBAT (Impact of cranberries on the microbiome and brain in healthy ageing)



PROJECT 2

METANOLS (Metabotypes in the urinary excretion of flavan-3-ol metabolites)



PROJECT 3
ERC PREDICT-CARE
(Work Package 1: Aggregate metabolic phenotypes for the main dietary (poly)phenols and factors associated with their formation)



REFERENCES

Cassidy & Minihane. (2017). The role of metabolism (and the microbiome) in defining the clinical efficacy of dietary flavonoids. *The American Journal of Clinical Nutrition*.
Gibney et al. (2019). Factors influencing the cardiometabolic response to (poly)phenols and phytosterols: a review of the COST Action POSITIVE activities. *European Journal of Nutrition*.
Palmnas et al. (2019). Perspective: Metabotyping- A potential personalized nutrition strategy for precision prevention of cardiometabolic disease. *Advances in Nutrition*.