

## Discovery of food-derived leads for immune health interventions

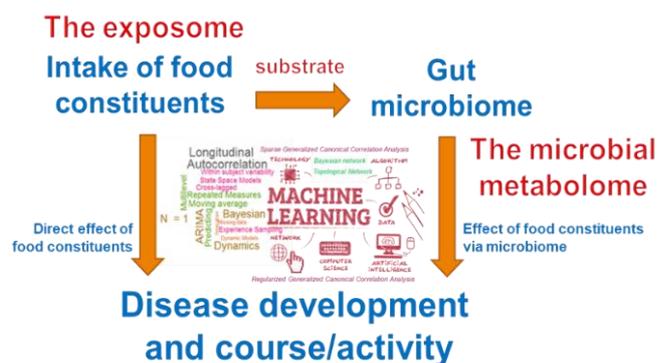


A well-functioning immune system is critical for adequate responses to daily life health challenges such as infections. But at the same time, overshooting immune responses may lead to allergic and inflammatory diseases. Our immune balances are determined by a complex interplay between intrinsic properties such as our genome, and extrinsic factors such as our diet. To date, the food compounds and the mechanisms through which these impact immune balances are largely unknown. Identification and characterization of immunomodulatory food compounds will help to unravel their role in inflammation and opens new avenues for immune health interventions.

Most studies on the role of diet in immune health and diseases conducted so far investigate the role of whole food products, product groups or selected groups of nutrients. It can be argued that the possible role of other immunomodulatory food compounds among the thousands of compounds ingested daily will be missed using this approach, may bias such studies, or may disturb the interpretation of these. We develop and apply methods to identify and characterise yet undiscovered immunomodulatory food compounds that play a role in inflammatory processes, with the aim to discover food-derived leads for immune health interventions.

Our team is specialized in combining and analyzing datasets to characterize the role of extrinsic factors in immune health, with a focus on food-borne factors, ultimately aiming at the development and improvement of population and personalized prevention, therapy and management of allergic and inflammatory diseases.

To explore the role of food compounds in inflammatory processes, we combine data on the presence and levels of over 20,000 individual compounds in food from existing databases and develop strategies for linking this information with food intake data collected in cohort studies. This allows to map the intake of these compounds through food at individual chemical level. Subsequent combination with information on inflammatory disease development, disease state, or disease course, allows to study the role of this wide spectrum of food compounds in immune health and inflammatory diseases. Combination with microbiome and microbial metabolome data further enables the characterization of the role of microbes in the immunomodulatory activity of food compounds. TNO's data science expertise, comprising of data warehousing, integration and analysis, such as mathematical modeling and machine learning, enables the complex data analyses needed for these integrated data sets.



### Collaboration with the University Medical Center Utrecht

Led by Prof. Dr. Geert Houben, TNO and University Medical Center Utrecht joined forces and closely collaborate in their research on food-borne factors in allergic and inflammatory diseases through a Research Chair at the Medical Faculty of the Utrecht University. For more information: [TNO Professors: Geert Houben](#)

### We are looking for partners in this research program.

We welcome industrial partners interested in studying food-borne factors in allergic and inflammatory diseases to discover food-derived leads for immune health interventions.

Our team is happy to discuss how we can collaborate and support you to address your specific needs tailored to your product development pipeline. Please contact: [Bas Kremer](#)