

Partner (including team members) Work group Expertise and activities

Prof Roger Adan, University Medical School Utrecht, The Netherlands

Chair of Cluster

Together with local collaborators Prof van Elburg (Psychiatrist) and Luykx (Psychiatrist and Geneticist) we will explore the genetics of amyotrophic lateral sclerosis (ALS), schizophrenia, eating disorders and BMI (with access UK biobank data and behavioral data) and have expertise in Mendelian randomization and related strategies. Animal models for testing the impact of nutrition on a variety of behavioral domains (impulsivity, cognitive flexibility, reward seeking, sensory processing).

Prof Suzanne Dickson, University of Gothenburg, Sweden

Co-Chair of Cluster

Animal models for testing the impact of gut-brain hormonal signals on a variety of behavioural domains (including those relevant for feeding control) and the neural circuits engaged. Interests extend to include a wide variety of orexigenic signals – hormones, hunger and environmental food cues.

Dr Francesca Cirulli, Istituto Superiore di Sanita, Rome, Italy

Co-morbidity between mental and metabolic disorders, with special reference to early determinants (stress and maternal obesity) and epigenetic signatures in relevant human cohorts. The aim is to derive polygenic risk scores and shared biological signals between metabolic and psychological stress.

Effects of targeted nutritional interventions in animal models of maternal obesity and their effects on epigenetic markers, cognitive and emotional behavior as well as microbiota.

Nutritional intervention study in metabolic syndrome patients testing the effects on neuropsychological functioning and inflammation.

Prof Jan Buitelaar Radboud University, Nijmegen, The Netherlands

The effects of nutritional interventions on behaviour, brain and microbiota (linked to the Eat2beNICE EU-funded project).

Effects of targeted nutritional interventions in animal models of maternal obesity and their effects on epigenetic markers, cognitive and emotional behavior as well as microbiota.

Dr Tony Goldstone, Imperial College London, UK

The influence of nutrition and appetitive gut hormones on eating and addictive behaviours including food hedonics, preference and cue reactivity, monetary reward processing, impulsivity, mood and negative emotional reactivity using functional neuroimaging in humans, including patients that have undergone dietary interventions, bariatric weight loss surgery, and potential role of microbiome and metabolomic changes.

Prof Beate Herpertz- Dahlmann, University of Aachen, Germany

Gut brain axis including the relationship between the microbiome and lowgrade inflammation in adolescents with anorexia nervosa (AN). Contribution includes long-term follow-up study involving structural MRI imaging in AN.

A microbiome intervention study in eating disorder patients.

Prof John Cryan University of Cork, Ireland

Together with my colleague Dr. Harriet Schellekens we are interested in understanding the role of the microbiome and microbial metabolites in modulating the effect of diet on brain and well-being in both animals and humans. A lifespan approach is undertaken including early-life, adolescence and ageing. This includes circuit-based and transcriptomic analysis in rodent brain and physiological and neuropsychological tests in humans with a special interest in stress, cognitive, food choice and social behaviors.

Prof Louise Dye University of Leeds, UK

The impact of nutrition on cognitive function and the potential impact of (psychological) stress on this relationship – including interactions with the gut microbiome. Delivery of interventions across the food system including e.g. breakfast interventions for school children.

Prof Gary Frost, University College London, UK.

Understanding the role of colonic microbial metabolites on the gut brain axis. Emerging evidence suggests that food that is processed by the microbiota can produce molecules that influence neuronal signaling in the brain. However, the evidence in humans of cause and effect is missing. There is urgent need to develop new methods to understand mechanisms of how food influences mental health.

Prof Philip Gorwood and Dr Odile Viltart, Paris Descartes University, France

"Remission in anorexia nervosa" which includes: interaction genetic x environment, genetic and epigenetic analysis (patients) and brain imaging (patients).

"Remission in AN" which includes: mouse model of chronic food restriction/ refeeding.

Prof Suzanne Higgs, University of Birmingham, UK

Using an experimental medicine models to understand the relationships between diet, cognition, reward and emotion and wellbeing.

Collaborators Prof Matthew Broome (Psychiatrist, University of Birmingham) and Dr Colin Dourish: (CEO of experimental company P1vital) have experience in youth mental health and clinical trials/the development of novel healthcare technologies.

Prof Johannes Hebebrand and Prof Lars Libuda University of Duisburg-Essen, Germany

Genetic look-ups and Mendelian Randomization analyses will be used for identification of potential links between single nutrients/metabolites and mental disorders. Links will be examined in an ongoing observational study which provides detailed information on dietary intake, nutritional biomarkers, body composition endocrine status (e.g. thyroid hormones), and mental health (e.g. diagnostic interviews) of > 450 patients.

RCT using multinutrient intervention study in depressed adolescents based on the individual micronutrient status.

Prof Ute Nothlings, University of Bonn, Germany

Nutritional epidemiology, investigating dietary risk factors (e.g. dietary patterns or extended to lifestyle patterns as well as metabolomic measures for dietary biomarkers/associated variables), for diverse outcomes such as fluid intelligence in children and adolescents (linked to the Diet-Body-Brain and DONALD studies).

Prof Jannus Harro, University of Tartu, Estonia.

Longitudinal studies of diet, body composition, lifestyle, personality, behaviour and mental health, and focus on gene-environment interactions.

The ECPBHS (original n=1238; www.ecpbhs.ee) has lasted for 21 years, data at present cover the age range 9 to 33 of the target subjects with detailed assessments at age 9, 15, 18, 25 and 33; includes most of their parents and will be extended in 2019 to the offspring of the target subjects.

Personality, molecular genetics, autoantibodies, microbiome in eating disorders and bariatric surgery.

Animal models for neurobiology of trait-wise hedonic behaviour, high carbohydrate intake, and stress resilience.

Dr Jose Manuel Fernandez-Real, University of Girona, Spain

Expertise in longitudinal studies evaluating the specific effect of diet on neurocognitive functioning and neuroimaging, the gut metagenome, and the plasma/faecal metabolome. Longitudinal studies evaluating volumetric and connectivity analyses (from both structural and functional brain data) in relation with the above-mentioned variables.

Prof Eline Van der Beek, Danone Nutricia Research Utrecht & University of Groningen, NL

Effects of early life dietary interventions (protein, carb & fat quality) on growth, brain & metabolic function in healthy and @risk animal models;

Impact of maternal health during pregnancy (impact of gestational diabetes/insulin resistance & maternal obesity) on brain & metabolic read outs in the offspring in animal model setting.

Impact of maternal glucose-insulin metabolism during pregnancy on infancy outcomes in clinical setting.

Prof Lora Heisler, University of Aberdeen, UK

Food as a trigger to activate reward and motivation pathways – in particular sugar – and how this is mediated by a neural circuit involving 5-HT signaling to the dopamine reward circuit. Studies performed in preclinical models using state of the art genetic, chemogenetic, optogenetic and behavioral technology.

Defining brain circuits that underpin binge eating, stress and anxiety and their impact on diet preference and feeding behavior.

Mathematical modeling and artificial intelligence to identify new links between nutrition and mental health.

Dr Aniko Korosi, University of Amsterdam, The Netherlands

Pre-clinical studies on early-life stress as risk factor for psychiatric disorder and comorbid metabolic derangements and the role of essential nutrients (fatty acids and micronutrients) in these effects.

Use of nutritional interventions to protect against negative effects of early-life stress. Focus on early nutrition and maternal breast milk and how this is affected by adverse maternal environment in pre-clinical models and humans with focus on the importance of breastmilk and how this is affected by the environment and maternal health (stress, obesity).

Prof Alex Johnstone, University of Aberdeen, UK

The role of diet on health with focus on controlled dietary intervention studies to explore mechanisms associated with the food-gut-brain axis in healthy volunteers and patient groups.

Knowledge exchange and impact delivery champion – to work with a range of stakeholders (health professionals, academia, general public, food industry, policy) across different media (online presence to face-to-face) to highlight challenges and opportunities for the role of diet to improve health and wellbeing.

Prof Lucia Reisch, Copenhagen Business School, Denmark.

Building on the results of Clusters 1, 2 and 3, an “evidence atlas” consisting of evidence maps will be compiled to inform policymakers, policyshapers (stakeholders) and consumers about a) existing solid evidence regarding causal pathways and b) effective behavioural and nutritional strategies to improve and maintain mental health. Designing and testing implementations is conducted in interactive co-design and co-development processes with policy makers, businesses, patient groups and other relevant stakeholders such as health insurances and consumer advocacy groups).