

PhD Student **Camilla Cederbye Karlsson**, MSc

Place of enrolment: University of Copenhagen, Faculty of Health and Medical Sciences

Principal supervisor: Associate Professor Niels Grarup, University of Copenhagen, Novo Nordisk Foundation Center for Basic Metabolic Research

Title of project: Elucidating the genetic background of variation in human food and taste preference

ABSTRACT

Background: Eating behavior is complex and influenced by several factors including food preference and liking. Recent studies suggest a link between food liking and factors such as appetite regulating hormone levels and oral microbiota composition. Other data indicate associations between genetic variation, food preference and liking, and food intake. *The hypothesis of the proposed project is that genetic variation contributes to eating behavior in humans, mediated by differences in taste preference and liking, and that preference is related to appetite-regulating hormones and oral microbial activity.*

Aim: We aim to identify novel genetic variants of taste preference and liking using a taste preference and liking questionnaire leveraging existing large-scale data collections. Additionally, we aim to compare taste preferences, taste perception, appetite-regulating hormone levels, and oral microbiome composition in a subset of individuals.

Methods: We have composed a taste preference and liking questionnaire focusing on the six taste modalities sweet, sour, bitter, salt, umami, and fat. One hundred thousand participants from previous studies will be electronically invited to complete the questionnaire in the GDPR-compliant online database REDCap. We have existing elaborate data, including genome-wide genotyping, on the participants, which will allow for a well-powered subsequent genome-wide association analysis for identification of genetic associations. In a recall-by-phenotype design, the perception of sweet, salt, and fat will be examined in 100 individuals showing high or low preferences for the three major taste modalities. Finally, we will assess the interactions between the oral microbiome, hormone levels and taste preferences in a multivariate analysis.

Future perspectives: This study will provide novel insights into mechanisms underlying human food behavior. The knowledge gained will lay the course for future functional and clinical studies and inspire therapeutic strategies for individuals prone to eating energy-dense food.