Project Title: Early life programming of appetitive behaviours: a study in twins

Principal researcher:
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Research project

Background (max. 1000 characters):

Brief background overview of the research field also providing an explanation of the innovative nature of the application.

The obesity pandemic that we face nowadays as a major public health challenge is believed to result from the interaction between genetic and environmental factors (1). The behavioural susceptibility theory proposes a mediation effect of appetite on the association between genes and obesity (2). Individuals who inherit a more avid appetite, expressing a high responsiveness to external food cues or lower sensitivity to internal satiety signals are more likely to overeat in response to the modern food environment. As the environment promotes eating, genes for high food responsiveness or low satiety responsiveness are overexpressed (3).

This project aims to explore the contribution of appetitive behaviors as drivers for excess adiposity gain across life, supporting evidence for possible gene-environment interactions which increase obesity risk since early ages. This will be accomplished using extensive data collected from longitudinal cohort studies including twins that offer an ideal opportunity to study genetic and environmental variations as a dynamic trait.
Research plan and methods (max. 2000 characters):

Describe the research plan and methods. Identification of the major scientific question you wish to address and the objectives of the project. Provide a general description of the approach used to reach the aims.

This project aims to understand the development trajectory of appetitive behaviours from infancy to late childhood and their early life programming, namely nutritional and environmental exposures (prenatal and early postnatal) and their effects, disentangling the role of genes vs. shared environment in these associations.

Its specific aims are:

i) To study the association of the intrauterine environment (under- or over-nourishment) in the establishment of appetitive behaviours in infancy, highlighting differences among twins and singletons.

ii) To determine how much the early feeding environment (first months of life) can influence the development of appetitive traits of twin dyads;

iii) To estimate the heritability of appetite in infancy and early childhood and the contribution of the shared environment in the establishment of appetitive behaviors;

iv) To evaluate the tracking of appetitive behaviours from early to late childhood putting into evidence differences among twin dyads;

v) To assess the effect of these appetitive behaviours across childhood in the metabolic profile later in life.

New findings will be disseminated to parents, health professionals and the civil society.

This project will use longitudinally collected data from two ongoing cohorts - Bitwin and Generation XXI. The Bitwin cohort includes almost 1,000 neonates (235 twin pairs, 479 singletons) born at public maternity units from Porto, Portugal during 2017-2019, and followed-up throughout infancy (at 4, 8 and 12 months postnatal). Generation XXI is a birth cohort including 8647 children assembled between 2005-2006 in all public maternity units from Porto, and followed-up at 4, 7, 10 and 13 years old. Both cohorts provide extensive data on biological samples, child anthropometry and health, environmental exposures and diet from both mothers (during pregnancy) and children. Appetitive traits were collected in both cohorts at different ages using validated tools, such as the Baby and Children’s Eating Behaviour Questionnaire (4).

Fellowship Position description (max. 1000 characters):

Identification the applicant’s expected qualifications and key skills and a brief description of the planned activities/duties.

This position is for a Ph.D student in Public Health with research interests in eating behaviours formation and obesity epidemiology. The student involved in this project will be included as research member of the Nutrition and Obesity Epidemiology Research Group of the EPI-Unit from ISPUP.
The student will have access to extensive data previously collected within large prospective cohorts at different time periods, namely Bitwin and Generation XXI. He/she will get expertise in data handling and in the application of statistical methods to measure longitudinal associations using multiple observations, and gene-environment interactions using the sub-cohort of monozygotic twins (in-pair analysis of discordant monozygotic twins).

The Ph.D thesis will be composed for at least 5 scientific papers, published in sound peer-reviewed scientific journals. Scientific writing, oral communications and critical scientific thinking will be promoted. Seminars and conference attendance will be highly encouraged, as well as international collaborations and stays in other research centres.

References