

Swiss Federal Institute of
Technology - EPFL
Integrative Food and
Nutrition Center - IFNC

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The healthcare and productivity costs arising from obesity and type II diabetes are major concerns for governments, corporate organizations and NGOs globally. Foods that are high in calories / sugars are cited as contributing to the rise in obesity and diabetes. How this occurs is complex, and involves the interaction of factors such as; Physiology, behavior (social context/familial upbringing etc.), societal factors, and the availability of appealing calorie dense food etc. Consequently addressing the problem of obesity and diabetes requires a dual approach involving both nutrition and lifestyle. Nestlé, as a leading food manufacturer, continually strives to produce and develop healthier and more nutritious products. To this end Nestlé, in partnership with the *EPFL Integrative Food and Nutrition Centre*, invites expressions of interest to help build research projects that addresses *the rise of obesity and type II diabetes* by:

“Understanding how to balance the enjoyment of food with the effects of calories”

There are many core sciences that can contribute to understanding this problem; these might be focused around four key areas:

- i) Human Nutrition and Metabolic Health
- ii) Chemistry, Material Science, Engineering and Applied Mathematics,
- iii) Human Perception, Sensing and Integration,
- iv) Psychology as well as Evolutionary Biology.

The IFNC & Nestlé is looking for innovative ideas that take a fresh look at this problem, proposals **MIGHT** look like the following;

What drives excess energy intake?

- To what extent do sugar and fat content drive preference / food intake?
- How do we decouple hedonic reward from (over) consumption?
- Are there specific food experiences that deliver a comparable satisfaction to sugar and fat?

What are the biological mechanisms through which high glycaemic or insulin responses after a meal increase the risk for developing type II diabetes?

- How can mathematical approaches (ie. control systems) be applied to better understand the dynamics/control of carbohydrate metabolism?
- What is the feasibility of developing (semi invasive) insulin sensor for real time insulin monitoring?

Can we develop improved in vivo imaging and data analysis/reduction techniques to facilitate a more sophisticated understanding of the Oral/Gastrointestinal degradation & transport processes of foods following consumption?

How might food structures impact the enjoyment of food, calorie intake, and/or the risk of obesity/type II diabetes?

- How do natural plant structures compare to processed foods in terms of satisfaction and absorption kinetics?

We are looking to fund **2 to 5** pre-competitive project proposals of the order of a **post doc for 1-2 years** that take a fresh look at these problems. Seed funding for head start projects of the order of **0.5 of a post doc for 1 year** may also be considered. The proposals that are selected may either be funded directly or be further refined through workshops.

A number of events are planned to stimulate interaction and create impactful project proposals to address this research challenge (see below). For those that are interested, **you are welcome to send 4-5 lines before the 25th of June describing your idea** to **Dr Stefan Meyer** (stefan.meyer@epfl.ch) to help stimulate interaction between IFNC and relevant Nestlé scientists during the proposal building process.

Research laboratories from EPFL, CHUV, UNIL, Agroscope, applied Universities and ETHZ are welcome to submit a proposal, however, one of the P.I.s has to be from the EPFL and one from the Nestlé Research Center. Participants are allowed to submit more than one proposal. Projects will be conducted within the EPFL-Nestlé industrial contract agreement where IP ownership will be negotiated.

