Proposal for a 2nd year Master internship (2020-2021)

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Project title:

Effects of intense artificial sweetener consumption on cardiovascular function and glucose metabolism in diet-induced obese mice.

Internship proposal :

Recent observational studies (1) report an increase in cardiovascular morbidity and mortality in regular consumers of diet soda drinks with an increased risk in people with obesity (3). Our laboratory is currently leading an experimental project that seeks to establish the existence or absence of a causal link between these two events. In our team, a first study in healthy rats, showed an accumulation of visceral adipose tissue accompanied by impaired endothelial function after 10 weeks of consumption of a cocktail of sweeteners (4). However, the mechanisms explaining the specific increase in cardiovascular risk and the specific impact of each sweetener molecule remain to be elucidated. In this regard, we will first study the effect of intense artificial sweeteners (Sucralose, Acesulfam K and Saccharin). In a future study, we will address the question whether natural sweeteners (Stevia, Stevioside, Rebaudioside A) and artificial sweeteners induce different biological responses.

To answer these questions, our laboratory has developed a large number of laboratory techniques ranging from *in vivo* physiology to molecular biology and cell culture.

Main methods considered:

- Animal monitoring (body mass, preparation of food and drink rations, food consumption record).

- In vivo glucose tolerance (OGTT) and insulin (ITT) tests. Blood sampling throughout the protocol.

- Measurement of in vivo arterial blood pressure.

- Evaluation of morphology and cardiovascular function, both in vivo (ultrasound echocardiography) and ex vivo (isolated organ stations).

- Post-mortem tissue sampling.

- Test of angiogenic capacities of budding (Sprouting assay) on aorta rings in matrigel.

- Isolation and cultivation of vascular smooth muscle cells.

References:

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Additional information of interest:

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