The importance of enteral feeding and/or gut hormones during intestinal disease in a model of total parenteral nourished (TPN) rat

Master project with supervisors Hannelouise Kissow and Jens Juul Holst

Background
- Anti-neoplastic treatment has significantly improved disease control in pediatric cancer patients, however with significant costs of severe acute gastrointestinal toxicities.
- A major clinical challenge is obtaining sufficient nutrition during the acute and recovery phase, due to anorexia and malabsorption. Children are therefore nourished by total parenteral nutrition.
- This prevents enteral stimulation of the endocrine L-cells with nutrients or luminal metabolites

Hypothesis
We hypothesize that the lack of endogenous glucagon-like peptides contributes to the toxicity with impaired gut barrier function and a delayed adaptive response.
Method

To study this, we will use a rat model. Rats will be fitted with a catheter in carotid artery and the jugular vein. In this way, we can have a model of TPN and draw blood samples every day. Day 6 after operation the rats will be given chemotherapy. Blood samples will be analysed for GLP-1, GLP-2, inflammatory markers and citrulline. The last day the rat will be killed, and the organs harvested for further analysis.

Example of an experiment

Aims

The master student will be responsible for the execution of the experiment and for the subsequent analytic work (with close supervision).

Obtained competencies

- Insight in operative procedures in rats
• Hands on experimental work, training in rat handling

Lab work
• Radio immuno assay (RIA)
• Elisa
• Histology and immunohistochemistry
• Fundraising
• Manuscript writing

Qualifications
• License to perform animal experiments