

## Learning objectives AGEM PhD-student course

### Learning objectives AGEM PhD-student course overall:

From the AGEM PhD-student course the student should learn:

- to describe and summarize metabolism, endocrinology and the liver and gastrointestinal system in health and disease.
- to recognize and describe current issues in metabolism, endocrinology and gastroenterology research and clinic.
- to explain why and how basic and applied research can be used to solve issues in metabolism, endocrinology and gastroenterology.
- to describe why and how top researchers are active in metabolism, endocrinology and gastroenterology.
- to clearly present scientific data and explain background information.

### Learning objectives AGEM PhD-student course assignment and pitch workshop:

From the assignment and the pitch workshop the student should learn:

- to write a concise and convincing proposal.
- to think outside of your own area of expertise and work together with researchers from different disciplines.
- to write a proposal that fits within an indicated (limited) budget.
- to pitch your proposal in a clear and attractive manner (pitch workshop).

### Learning objectives AGEM PhD-student course WEEK 1

At the end of this week, the student:

#### *Week 1 Metabolism*

- understands the role of glucose metabolism in relation to inflammation and energy metabolism.
- understands the central role of glucose metabolism as biosynthetic molecule.

#### *Week 1 Endocrinology*

- has gotten insight in the broad field of Endocrinology.
- understands the main hypothalamus-pituitary axes and their effects on peripheral tissues.
- understands the difficulty of measuring hormones with respect to laboratory techniques as well as sampling time.

#### *Week 1 Gastroenterology and hepatology*

- has a broad overview of the major GE related research fields within the Amsterdam UMC
- understands the use of gene therapy in liver diseases
- understands the use of organoid culture systems in studying intestinal disease and development
- has insight into metabolic processes in intestine and liver

#### *Week 1 Immunology*

- is introduced to the research in immunology at the VU
- has a basic knowledge of current options for single cell technology research
- understands the specific metabolism in macrophages

### *Week 1 Microbiome*

- understands that causality of gut microbiota in many human diseases is unknown.
- can explain that fecal microbiota transplantation studies in humans suggest a role for specific bacterial strains in disease.
- can explain current hypotheses on how the microbiome alters human cardiometabolism
- can explain that responders and non-responders in relation to gut microbiota-based interventions and classifications are to be discerned.
- understands that the gut harbors an ecosystem and that the study of (transkingdom) interaction between its members is important to understand microbiota-related pathologies and to design effective interventions

### **Learning objectives AGEM PhD-student course WEEK 2**

At the end of this week, the student:

#### *Week 2 Endocrinology*

- understands the role of thyroid hormone in liver metabolism and the role of PTH and calcium on bone metabolism.
- can explain the role of time in central and peripheral hormonal regulation.
- comprehends the influence of hormonal excess on the body as well as on the other HP-axes.

#### *Week 2 Metabolism*

- understands the central role of carbohydrate metabolism in organism integrity.
- understands the central role of lipid metabolism in organism integrity.
- understands the central role of protein metabolism in organism integrity.
- understands the interaction between carbohydrates, lipids and protein in energy homeostasis.

#### *Week 2 Gastroenterology and Hepatology*

- has an overview of (common) liver pathology and the biological mechanisms
- has an overview of (common) hepatobiliary pathology and the underlying biological mechanisms
- has an idea of the clinical and cell biological aspects of colon and esophageal cancer
- has an overview of IBD pathology from a medical and surgical perspective
- can provide examples of the role and therapeutic potential of the microbiome in gastrointestinal disease

#### *Week 2 Endocrinology / Metabolism / Gastroenterology and Hepatology*

- can clarify the role of incretins and insulin in the pathogenesis of diabetes mellitus.
- can explain what insulin resistance means and can comprehend the different methods to measure it.
- understands the role of the brain in insulin secretion.
- understands the profound metabolic, endocrine and inflammatory effects of fasting and eating and their role in physiology.