

# Cycle H: Molecular Medicine

**Coordinator: Radek Skoda**

## **H1: Molecular Medicine I – 22831**

(2 hrs/week; 2 CP; Fall 2019)

## **H2: Molecular Medicine II – 12424**

(2 hrs/week; 2 CP; Spring 2020)

Ch. Handschin, M. Heim, **R. Skoda**

The purpose of this lecture series is to introduce biologists to the mechanisms that cause human diseases. Emphasis will be on the genetic and environmental factors that lead to diseases, and how this knowledge can be used to develop diagnostic and therapeutic procedures. The series will start with a lecture on the human genome and its impact on molecular medicine, followed by lectures on infectious diseases (e.g. AIDS, Malaria), and disorders of the immune system (e.g. rheumatoid arthritis). Other lectures will concentrate on organ systems such as blood, cardiovascular system, gastro-intestinal and respiratory system and more general topics such as cancer, psychiatric disease and aging.

## **H3: Molecular Control of Vertebrate Development and Organogenesis – 14459**

(2 hrs/week; 2 CP, Fall 2020)

J. Lopez-Rios, V. Taylor, **R. Zeller**, A. Zuniga

This course will introduce the participants to the basic principles, genetic tools and vertebrate model systems used to study developmental processes. The main part of the lecture is dedicated to introducing and discussing the development of organs and central nervous system (organogenesis). Particular emphasis will be given to the current knowledge of the gene regulatory networks, signaling interactions and transcriptional regulation of organogenesis. In addition, the participants will learn about the insights the analysis of vertebrate development provides into the molecular changes underlying evolution of vertebrates (Evo-Devo). Also, the relevance of development control mechanisms for tissue engineering, stem cells and human congenital malformations will be highlighted. This course will cover both basics and cutting edge novel findings relevant to a good understanding of the molecular mechanisms governing embryonic development and organogenesis in vertebrates.

#### **H5: Translational Cancer Research – 12420**

(2 hrs/week; 2 CP; Spring 2020)

G. Christofori, B. Groner, M. Hall, M. Heim, **N. Hynes**, J. Schwaller, R. Skoda, M. Wymann, A. Zippelius

The aim of the course is to give students in the life science area broad knowledge in the cancer research. The lecturers discuss all aspects of cancer research, ranging from molecular results gleaned from basic research, encompassing the pathology of cancer and finally discussing new and 'old' cancer therapeutics. The lecturers range from those conducting basic research in the cancer area, to scientists developing novel anti-cancer therapeutics in the pharmaceutical industry, to clinicians who work daily with cancer patients. The course is carried out in two cycles, each in the spring semester, and is aimed at advanced students in the life sciences.

#### **H6: Molecular Basics of Tumours in Humans - Detection to Treatment I – 52325**

(3 days; 1 CP; Fall 2019)

#### **H7: Molecular Basics of Tumours in Humans - Detection to Treatment II – 52326**

(3 days; 1 CP)

#### **E. Obermann**

This series of lectures will give a systematic overview to cancer in humans.

The first part of the course will be introducing and discussing general aspects of neoplastic diseases – definition, epidemiology, prevention, detection, carcinogens, and hereditary tumour syndromes.

The second part of the course will focus on the most important tumour entities such as breast cancer, ovarian cancer, colon cancer. Each lecture will be dedicated to a specific tumour entity. These lectures will discuss the unique characteristics of the disease on the one hand, while on the other hand, a unique molecular aspect (which may be relevant for detection, prevention or treatment) of this tumour entity will be discussed in depth. In addition, participants will learn about the clinical side of cancer (e.g. cancer screening programmes worldwide and in Switzerland, procedure of radiotherapeutic treatment, types of chemotherapy and tumour surgery). This course will therefore cover both general clinical aspects and cutting edge novel aspects which are relevant for the understanding of neoplastic disease in humans.