Molecular and Clinical Aspects of Cancer

Online PhD Course in March 2021
The Faculty of Health Sciences at the Arctic University of Norway, University of Tromsø, would like to invite you to participate in a comprehensive course on molecular and clinical aspects of cancer. The study program focuses on the underlying mechanisms for cancer development but also serves as a more general introduction to basic disease mechanisms. The complete program is composed of two separate courses that may be followed independently.

We hope that you or any of your students, colleagues or staff will find interest in this multidisciplinary study program and participate in parts or all of it. We very much appreciate your help in forwarding this invitation to others that might be interested.

Each course is awarded 10 ECTs. The courses can be taken independent of each other.
Course Aims

Information
Provide cutting edge, integrated information concerning molecular and clinical aspects of cancer to scientists, clinicians and students of science and medicine

Training
Provide training in analytical and critical approaches to cancer-related research and literature

Sharing
Attract and bring together participants from different fields and institutions
Topics

- Molecular Genetics of Cancer
- Signal Transduction and Cancer
- Tumor Biology
- Chromatin Organization and Epigenetic Mechanisms of Cancer
- Infection, Inflammation and Cancer
- DNA Repair
- Cancer Stem Cells
- Molecular Epidemiology of Cancer
- Novel Approaches in Molecular Medicine and Immunotherapy of Cancer
Specific Mechanisms of Cancer and Strategies for Therapeutic Intervention

Module I
Covers the topics of DNA repair, Transcriptional regulation, Chromatin and Epigenetics and the impact of these processes on the fidelity of maintenance of proliferation, survival and differentiation of the cell. How dysregulation of any these processes may contribute to cancer development is highlighted.

Module II
Topics are infectious agents and their involvement in different cancer types, chronic inflammation and cancer, and the role of cancer stem cells. The infectious agents focused on are viruses, and how they may disturb the normal regulation of eukaryotic cells. Chronic inflammation is linked to cancer, and the molecular mechanisms involved will be presented. Finally, the presence and roles of cancer stem cells in both solid and hematopoietic tissues will be discussed.

Module III
Covers how cancer treatments can benefit from targeted therapy, cancer -omics and cancer epidemiology. Targeted therapeutic drug regimens and immunotherapeutic strategies will be focused on. The omics and epidemiology sections highlight the impact of genetic and environmental factors in cancer development.

The course includes:
- 5 days of lectures
- 3 days of student seminars
- 2 days of seminar preparations
Due to the Corona situation, the course will be online in March 2021. No course fee.
Molecular Basis for Cancer Development

Module I
Provides a broad overview of the molecular genetics of cancer, and discusses the basic molecular mechanisms leading to development of cancer. The main issues are mechanisms for cell-cycle regulation, proliferation, transformation, cell invasion and cell survival. How dysregulation of any of these processes may contribute to cancer development is discussed. Therapeutic strategies that arise from an understanding of these mechanisms are also discussed.

Module II
The topic is signal transduction and cancer. Here the various intracellular signaling pathways that are found to be dysregulated in cancer are discussed. Among these are the pathways that regulate cell proliferation, cell survival, metabolism, transformation and differentiation.

Module III
Covers a broad overview of tumor biology. Here the main mechanisms that regulate metastasis, angiogenesis, and apoptosis are described. These processes are fundamental for embryogenesis, but are also central in the establishment and maintenance of cancer cells. Students are introduced to the pathobiology of cancers in the context of the mechanisms that are discussed.

The course includes:
✓ 6 days of lectures
✓ 2 days of student seminars
✓ 2 days of seminar preparations
✓ 6 weeks to complete an essay
Application Deadline MBI-8007

June 1\textsuperscript{st} 2021

There is no course fee.
Lecture Schedule

**MBI-8007 (Autumn)**

**Molecular and Clinical Aspects of Cancer Development**
Including cancer genetics, signal transduction and tumor biology

6 days lecture

2 days of student seminars
2 days of seminar preparations

6 weeks to complete an essay

**MBI-8008 (Spring)**

**Cancer Prevention, Diagnosis and Treatment**
Including infectious agents and cancer, DNA damage and repair, chromatin structure, transcription, epigenetics, stem cells, cancer epidemiology and targeted therapy

5 days lecture

3 days of student seminars
2 days of seminar preparations
Lecturers

The course is taught by an international staff and lecturers renown in their respective fields of research.

MBI-8008 (Spring)

Sonia Rocha, PhD, University of Liverpool
Simon Cook, PhD, University of Cambridge
Rune Linding, PhD, Germany
Hege Russnes, M. D. PhD Oslo University Hospital
Ragnhild Eskeland, PhD, University of Oslo
Judith Stärk, PhD, University of Oslo
Else Marit Inderberg, PhD, Oslo University Hospital
Rein Aasland, PhD, University of Oslo
Arne Klungland, PhD, Oslo University Hospital
Ugo Moens, PhD, University of Tromsø
Karina Standahl Olsen, PhD, University of Tromsø

MBI-8007 (Autum)

Eric J. Stanbridge, PhD, University of California at Irvine
Channing Deer, PhD, University of North Carolina at Chapel Hill
Geir Bjørkøy, PhD, Norwegian University of Science and Technology
Stephen Baird, M.D. PhD, University of California at San Diego
Geoffrey Baird, M.D. PhD, University of Washington Medicine
Tuomas Tammela, M.D. PhD, Memorial Sloan Kettering Cancer Center
Terje Johansen, PhD, University of Tromsø

Need more info?
Application Process forskningstjenester@helsefak.uit.no

Course Information
eva.sjottem@uit.no

MBI-8008