



MODULE 5: NEOPLASTIC DISEASES

Code: 43646

Type: Elective

Credits: 6 ECTS

Language: English (75%)/ Spanish (25%)

Module's Coordinators:

Dr. Josep Roma

✉ josep.roma@vhir.org

Schedule for mentoring: Tuesdays, from 4:00-5:00 pm

Although having this timetable proposal, the students have to arrange an appointment with the teacher by e-mail.

OBJECTIVES

The objectives of this module are:

- to provide the students with sufficient knowledge about the relevant characteristics of the cancer process, including its establishment and progression,
- to distinguish the morphology and patho-physiology, as well as the main molecular alterations of a number of tumor types, all essential elements for the diagnosis and treatment of the disease.

SKILLS

E01. Identify and use the tools, techniques and methodologies of translational clinical research to solve problems in human health.

E01.10. Learn morphological, imaging, biochemical, genetic, molecular and cellular techniques used in oncology basic research, and their application in clinical pathology.

E01.11. Knowing the state of the art in diagnosis, treatment and outcome of patients with tumors.

E03. Analyze the patho-physiology at the molecular level using the scientific method and identify its relationship with the clinical process of different diseases.

E03.5. Characterize the morphology and patho-physiology of the different types of neoplasia.

E03.6. Identify the most important oncogenic processes to improve the intervention at diagnosis and treatment levels.

CONTENT

Lesson 1. Introduction to neoplastic diseases

- 1.1. Introduction to molecular tumor pathology
- 1.2. Tumor stage TNM, biomarkers, tumor markers
- 1.3. Clinical diagnosis: Imaging techniques

Lesson 2. Epidemiology, diagnosis and treatments

- 2.1. Epidemiology. Familiar transmission and sporadic cancer
- 2.2. Pharmacology and antitumor strategies
- 2.3. Immune response and inflammation in cancer
- 2.4. Alternative therapies: soluble forms of immune receptors as anti-tumor immunotherapeutic strategy
- 2.5. Alternative therapies: CRISP/R CAS technology in cancer
- 2.6. Diagnosis based on nanotechnology
- 2.7. Alternative therapies: nanotechnology and biological therapy

Lesson 3. Molecular biology of cancer

- 3.1. The Hallmarks of cancer: evading growth suppressors, drivers sustaining proliferative signaling
- 3.2. Tumor promoted angiogenesis
- 3.3. Invasion and metastasis
- 3.4. Cancer cell cycle control, mitotic control and replicative immortality
- 3.5. Cancer cell metabolism (therapeutic opportunities)
- 3.6. Senescence in tumor progression
- 3.7. Autophagy in cancer progression
- 3.8. Genome instability, mutations, mechanisms of resistance in chemotherapy, radiotherapy

Lesson 4. Gastrointestinal tumors

- 4.1. RHO GTPases in gastrointestinal tumorigenesis
- 4.2. Normal stem cells and cancer stem cells
- 4.3. New target-directed therapies for the treatment of colorectal cancer

Lesson 5. Brain Tumors

- 5.1. Central Nervous System tumors characteristics.
- 5.2. Treatment of Glioblastomas. Building a clinical research program in GBM

Lesson 6. Urologic tumors

- 6.1. Clinical presentation and current diagnostic tools for urologic tumors. Prostate carcinomas: a vision from the clinics in the contest of translational research.
- 6.2. Aggressive prostate cancer, molecular characteristics. In search of biomarkers of resistance and new therapeutic targets: role of the oncogenic PTOV1.
- 6.3. Prostate cancer: Biomarkers for the early detection and prognosis, strategies for biomarkers search.
- 6.4. Renal cell carcinoma: Guidelines for diagnosis, treatment and monitoring

6.5. Renal cell carcinoma: Overview. Clear-cell renal carcinoma (ccRCC): genetic factors, mechanisms of progression and treatments.

Lesson 7. Gynecologic tumors

7.1. Endometrial and ovarian cancer: Update in the classification

7.2. Endometrial cancer: From the onset of the tumor to the development of metastasis. Translational research to approach unmet clinical issues.

7.3. Ovarian cancer: Molecular research on diagnosis and dissemination

7.4. Breast cancer: Introduction: types, characteristics. Cellular transformation, malignant progression by HER receptors. Mechanisms of resistance to anti-HER therapies.

Lesson 8. Childhood cancers

8.1. Introduction to the most common tumours in childhood and adolescence. Epidemiology, diagnosis and treatment.

8.2. Biologic and clinical characteristics of embryonic tumours.

8.3. Molecular biology of soft tissue sarcomas. The oncogenic role of embryonic signal transduction pathways

8.4. Role of microRNAs and epigenetic genes in the behaviour of neural tumours.

Lesson 9. Hematologic tumors

9.1. Introduction to hematological malignancies

9.2. Progression and pathogenesis of hematological malignancies

METHODOLOGY

Theoretical classes

Making reports/works

Autonomous study

Reading articles/reports of scientific interest

Presentation/ oral defense of works

Tutorials

EVALUATION

Theoretical exam	50%
Oral presentation	40%
Attendance and participation	10%

Attending a minimum of 80% of the classes is required for taking the exam and passing the course.

TEACHING STAFF

Josep Roma Castanyer, PhD – josep.roma@vhir.org

Principal Investigator in Translational Research in Child and Adolescent Cancer Research Group. VHIR.

Anna Santamaria Margalef, PhD – anna.santamaria@vhir.org

Principal Investigator in Biomedical Research in Gynecology Research Group. VHIR.

Miquel Segura Ginard, PhD – miguel.segura@vhir.org

Principal Investigator in Translational Research in Child and Adolescent Cancer Research Group. VHIR.

ACADEMIC SCHEDULE

Timetable: Classes will be from November 24th to December 10th 2021.

Oral presentations on January 12th and 13th; and exam on January 14th 2022.

See complete schedule for exact timetable of classes and exams

[See the Master's Degree Schedule for academic year 2021-2022](#)

Classroom:

Please, check the information board at the Academic Office in order to confirm the classroom before the class starts.