

Course unit name: NEW TREATMENTS IN HEMOPATHIES: FROM THE LABORATORY TO THE CLINIC

1.- General information

Code	303020	Plan		ECTS	3
Type	Elective	Course	2023/2024	Periodicity	2 st Semester
Department	Cancer Research Center				
Virtual Platform	Platform:	Studium			
	URL de Acces:	https://moodle2.usal.es/			

Faculty

Professor Coordinator	Dr. Marcos González Díaz. Catedrático. Full professor, University of Salamanca.				
Department	Nursery and Physiotherapy				
Research area	Oncohematología				
Center	.- Cancer Research Center (CIC) .- University Hospital of Salamanca (HUS)				
Office	Laboratory 12				
Tutorials	10.00-12.00 from Monday to Tuesday				
URL Web	https://www.cicancer.org/grupo?id=78				
E-mail	margondi@usal.es , marcosgonzalez@saludcastillayleon.es	Phone	.- CIC: +34 923294812 .- HUS: +34 923291100 Ext: 56635, 56751		

Professor	Dra. María Díez Campelo. Associate Professor				
Department	Medicine. University of Salamanca.				
Research area	Oncohematología				
Center	University Hospital of Salamanca				
Office	Laboratorio de Morfología, Bloque I-J, 3ª Planta, Hospital Universitario-IBSAL, Salamanca.				
URL Web	https://ibsal.es/es/tgyc-01-medicina-regenerativa-c				
E-mail	mdiezcampelo@usal.es	Phone	+34 923291100 Ext: 56636		

Professor	Dra. Lucía López Corral. Associate Professor		
Department	Medicine. University of Salamanca.		
Research area	Oncohematología		
Center	University Hospital of Salamanca		
Office	Unidad Clínica/Trasplante Hematopoyético, Hospital Universitario-IBSAL, Salamanca, Bloque A, 6ª Planta de Hematología		
URL Web	https://ibsal.es/es/tgyc-02-terapia-celular-y-trasplante-c		
E-mail	lucialopezcorral@usal.es	Phone	+34 923291100 Ext: 55108 y 566912

Professor Coordinator	Dra. Mª Victoria Mateos Manteca. Associate Professor		
Department	Medicine. University of Salamanca.		
Research area	Oncohematología		
Center	University Hospital of Salamanca		
Office	Unidad Clínica/Unidad de Ensayos Clínicos, Planta 0, Bloque C, Hospital Universitario-IBSAL, Salamanca		
URL Web	https://ibsal.es/es/canc-03-mieloma-multiple-y-nuevos-farmacos-c		
E-mail	mvmateos@usal.es	Phone	+34 923291100 Ext: 56993

Professor	Dra. Mercedes Garayoa Berrueta		
Research area	Oncohematología		
Center	Cancer Research Center		
Office	Laboratory 12		
URL Web	https://www.cicancer.org/investigador?id=46db6875-2a40-4120-bc8b-94de0cdf1836		
E-mail	mgarayoa@usal.es	Phone	+34 923294812

Professor	Dra. Teresa Paino Gómez		
Research area	Oncohematología		
Center	Cancer Research Center		
Office	Laboratory 12		
E-mail	tpaino@usal.es	Phone	+34 923294812

Professor	Dra. Dra. Norma Gutiérrez Gutiérrez. Associate Professor		
Department	Medicine. University of Salamanca.		
Research area	Oncohematología		
Center	Cancer Research Center		
Office	CIC: Laboratorio 12. HUS: Unidad de Citogenética, Bloque I-J, 3ª Planta, Hospital Universitario-IBSAL, Salamanca.		
URL Web	https://ibsal.es/es/canc-03-mieloma-multiple-y-nuevos-farmacos-c		
E-mail	normagu@usal.es	Phone	+34 923294812, +923291100 Ext: 56617

Professor	Dr. Ramón García Sanz. Associate Professor		
Department	Medicine. University of Salamanca.		
Research area	Oncohematología		
Center	University Hospital of Salamanca		
Office	.- Departamento de Medicina .- Hospital Clínico Universitario de Salamanca: Unidad de Biología Molecular/HLA ,3ª Planta, Bloque I-J, Hospital Universitario-IBSAL, Salamanca		
URL Web	https://ibsal.es/es/canc-05-biologia-molecular-y-celular-de-hemopatias-c		
E-mail	rgarciasanz@usal.es	Phone	+34 923291100 Ext: 56606

Professor	Dra. Verónica González de la Calle		
Department	Medicine. University of Salamanca		
Research area	Oncohematología		
Center	Hospital Clínico Universitario de Salamanca: Unidad de Biología Molecular/HLA ,3ª Planta, Bloque I-J, Hospital Universitario-IBSAL, Salamanca		
Office	Molecular Biology Laboratory		
URL Web	https://ibsal.es/es/canc-05-biologia-molecular-y-celular-de-hemopatias-c		
E-mail	vgcalle@saludcastillayleon.es	Teléfono	+34 923291100 Ext: 56608

Professor	Dra. M ^a Belén Vidriales Vicente. Associate Professor		
Department	Medicine. University of Salamanca.		
Research area	Oncohematología		
Center	Unidad de Citometría de Flujo 3 ^a Planta, Bloque I-J, Hospital Universitario-IBSAL, Salamanca. Laboratorio de Inmunopatología-Citometría de Flujo. 1 ^a Planta		
Office	Inmunopatología-Flow Cytometry Laboratory		
URL Web	https://ibsal.es/es/canc-05-biologia-molecular-y-celular-de-hemopatias-c		
E-mail	mbvidri@usal.es	Phone	+34 923291100 Ext: 56624

Professor	Dra. Noemí Puig Morón		
Research area	Oncohematología		
Center	Hospital Clínico Universitario de Salamanca Unidad de Citometría de Flujo, 3 ^a Planta, Bloque I-J, Hospital Universitario-IBSAL, Salamanca		
Office	Inmunopatología-Flow Cytometry Laboratory		
URL Web	https://ibsal.es/es/canc-17-microambiente-en-el-mieloma-multiple-y-lesion-osea-e		
E-mail	noepuig@gmail.com	Phone	+34 923291100 Ext: 56620

Professor	Dr. Alejandro Martín García-Sancho		
Department	Medicine. University of Salamanca.		
Research area	Oncohematología		
Center	Unidad de Citometría de Flujo 3 ^a Planta, Bloque I-J, Hospital Universitario-IBSAL, Salamanca. Laboratorio de Inmunopatología-Citometría de Flujo. 1 ^a Planta		
Office	Inmunopatología-Flow Cytometry Laboratory		
E-mail	amartingarcia@saludca.stillayleon.es amartingar@usal.es	Phone	+34 923291100 Ext: 56621

2.- The course in the context of the Master's Program

Training Module

The academic year is divided into five parts. This subject takes place in the fifth one.
Second term.

General aim of the subject

Professional specialization

3.- Previous recommendations

No prior requirements

4.- Aims of the subject

To acquire an overview of which are the main lines of current research in the treatment and monitoring of the response in haematological malignancies.

This general objective is divided into several sub objectives that are shown below:

To understand the different pathways and molecular processes involved in the development of tumours and to analyse which of these mechanisms can be used as antitumor targets. In this respect, it will be insisted on drugs, molecules or antibodies used for this purpose.

To know the different steps to be followed in the development of a new antitumor drug. The student must acquire/ gain knowledge of: the first steps of preclinical research; studies in experimentation animals; and the planning and conduct of clinical trials that will lead to the approval of the above mentioned treatment for its use in the Clinic.

To deepen the new clinical procedures that, nowadays, are improving the applicability of these new drugs to the daily Clinic. In this sense, it is intended to explain the new techniques for monitoring the response to these above-mentioned drugs (flow cytometry, molecular analysis, etc.). At the same time, the markers that will allow to know the potential resistance or sensitivity of a patient to a specific treatment will be analysed (clinical, genetic, molecular and phenotypic markers, etc.) and the variables within these techniques will be defined with prognostic value for patients.

To know the characteristics and different modalities of Hematopoietic stem cell transplantation (HSCT) and CAR-T cells.

To deepen the biology and possibilities of therapeutic action in graft versus host disease and the possibilities of modulating and enhancing the graft effect against tumour / leukaemia

To know the necessary laboratory techniques for the preclinical study of the efficacy and toxicity of a new antitumor drug. To do this, the student should familiarize with the techniques of cell line and cell culture obtained from patients.

Likewise, the student should have some knowledge of how the efficacy studies and mechanism of action are carried out: MTT studies; annexin V and cell cycle analysis by flow cytometry; expression microarrays to know induced changes in the gene expression profile; Western blot to study protein changes

To know how "in vivo" studies are performed in animal models with different haematological malignancies.

5.- Contents

Theoretical lessons:

1. Introduction to hematological malignancies. Types of hematological malignancies: myeloid and lymphoid; acute and chronic (Class 1). Dr. Marcos González
2. Introduction to hematological malignancies. Types of hematologic malignancies: myeloid and lymphoid; acute and chronic (Class 2). Dr. Marcos González
3. Technical foundations of multiparameter flow cytometry and its application to the study of hematological diseases. Dr. Belén Vidriales.
4. Applications of Molecular Biology in Malignant Hemopathies. "From the laboratory to the Clinic". Dr. Ramón García Sanz
5. Genomic techniques in haematology. Dr. Norma Gutierrez
6. Preclinical investigation of new antitumor drugs. "In vitro" studies, ex vivo and in vivo. Dr. Mercedes Garayoa
7. Clinical research of new antitumor drugs. Clinical trials: Phases of the trials. Monitoring efficacy and toxicity. Dr. M^a Victoria Mateos
8. New drugs based on Biology in Lymphoproliferative Syndromes. Dr. Alejandro Martín
9. New Drugs in Myelodysplastic Syndromes. Dr. M^a Díez Campelo
10. Bases for the healing of Multiple Myeloma. Dr. M^a Victoria Mateos.
11. Immunotherapy in Multiple Myeloma. Dr. Teresa Paino
12. Role of the microenvironment in tumour pathogenesis: Multiple Myeloma. Dr. Mercedes Garayoa
13. Bone lesion associated with multiple myeloma. Drugs that act on bone metabolism. Dr. Mercedes Garayoa.
14. Transplantation of hematopoietic progenitors in malignant hemopathies. Different strategies and indications. Dra. Lucia Lopez
15. Transplantation of hematopoietic progenitors in malignant hemopathies. New strategies to modulate the graft effect against host / tumour. Dra. Lucia Lopez.

Training:

1. The immunophenotype in monitoring the response in hematologic malignancies. Dra. Noemi Puig.
2. Evaluation "in vivo" of new antitumor drugs. Visit to the animal house
3. Molecular techniques in monitoring the response in hematologic malignancies. Dra Verónica González
4. Cytogenetic and genomic techniques in monitoring the response in hematologic malignancies.
5. Cell cultures. Cell lines and primary cells of patients.

6.- Skills to be acquired

Basic skills

- To know the basis of the new techniques for monitoring these diseases in the context of the new targeted drugs. The student must become familiar with immunophenotype techniques by flow cytometry, basic cytogenetic techniques (FISH, NGS) and molecular biology analysis such as quantitative PCR Specific.

Specific skills

- To know the necessary laboratory techniques for the preclinical study of the efficacy and toxicity of a new antitumor drug.
- To know how a clinical trial is planned: susceptible population, inclusion and exclusion criteria, evaluation methods of efficacy and toxicity.

7.- Teaching methodology

The student must attend 15 hours of theoretical lessons having previously read and understood the recommended bibliography as well as the presentations that will be explained in these theoretical lessons. The presentations and recommended bibliography are shown on the studium platform.

8.- Estimated learning time

	Hours tutored by the teacher		Individual work (hours)	TOTAL HOURS
	Attendance required (hours)	Distance learning (hours)		
Lectures	15			15
Practices	- In classroom			
	- In laboratory	10		10
	- In computer classroom			
	- Countryside			
	- Visualization classroom			
Seminars				
Work presentations and debates				
Tutorials	7			7
Online activities	12			12
Work preparation				
Other activities				
Exams - evaluation	1		30	31
TOTAL	45		30	75

9.- Materials

Books

Reference books for the student: Presentations and pdfs of recommended readings are uploaded to the Studium Platform

Other bibliographical, electronic references or any other type of resource

10.- Assessment

Assessments on the performance of the student

The students' participation in theoretical and practical sessions (20% of the final mark) will be evaluated.

Evaluation in writing (80% of the final mark).