

Course unit name: PRACTICUM IN BIOLOGY AND CLINIC OF CANCER

1.- General information

Code	303000	Plan		ECTS	18
Type	Mandatory	Course	2024/2025	Periodicity	Annual
Department	Cancer Research Center				
Virtual Platform	Platform:	CICLOUD			
	URL de Acces:	https://cicloud.dep.usal.es/			

Faculty

Professors	ALMEIDA PARRA, Julia (Catedrática USAL)	MARTÍN PENDÁS, Alberto (Profesor de investigación CSIC)
	BLANCO VENAVENTE, Sandra (Científico titular CSIC)	MORENO PÉREZ, Sergio (Profesor investigación, CSIC)
	BUENO NÚÑEZ, Andrés Avelino (Catedrático USAL)	MUÑOZ FÉLIX, José Manuel (Profesor Ayudante Doctor)
	CASTELLANO SÁNCHEZ, Esther (Científico titular, CSIC)	ORFAO DE MATOS, Alberto (Catedrático, USAL)
	DOSIL CASTRO, Mercedes (Profesora titular USAL)	PANDIELLA ALONSO, Atanasio (Profesor Investigación CSIC)
	DROSTEN, Matthias (Investigador científico CSIC)	PEREDA VEGA, José Maria de (Científico Titular, CSIC)
	ÉSPARIS OGANDO, Azucena (Contratado doctor ISCIII)	PÉREZ LOSADA, Jesús (Investigador científico, CSIC)
	FERNÁNDEZ MEDARDE Alberto (Profesor titular USAL)	PERICACHO BURGOS, Miguel (Profesor titular, USAL)
	FUENTES GARCÍA, Manuel (Profesor titular USAL)	RIVAS SANZ, Javier de las (Investigador Científico, CSIC)
	GARCÍA BUSTELO Xosé Ramón (Profesor Investigación CSIC)	RODRÍGUEZ BARBERO Alicia (Profesora titular, USAL)
	GARCÍA SÁNCHEZ, M^a José (Catedrática USAL)	SACRISTÁN MARTÍN, María de la Paz (Profesora titular, USAL)
	GONZÁLEZ SARMIENTO, Rogelio (Catedrático USAL)	SÁNCHEZ GARCÍA, Isidro (Investigador Científico, CSIC)
	GUERRERO ARROYO, Carmen (Catedrática USAL)	SANCHEZ-GUIJO MARTÍN, Fermín (Catedrático, USAL)
	HERNANDEZ RIVAS, Jesús María (Catedrático USAL)	SÁNCHEZ MARTÍN, MANUELA (PDI, USAL)
	HOLGADO MADRUGA, Marina (Profesora titular USAL)	SÁNCHEZ NAVARRO, AMPARO (Catedrática USAL)
	HURTADO RODRÍGUEZ, Antoni (Investigador científico CSIC)	SANTAMARÍA, DAVID (Científico titular CSIC)

	LLANO CUADRA, Elena (Profesora titular USAL) MATEOS MANTECA, MARÍA VICTORIA (Profesora titular USAL)	SANTOS DE DIOS, Eugenio (Profesor emérito USAL) VICENTE MANZANARES, Miguel (Científico Titular CSIC)
Center	Cancer Research Center	

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

Training Module
From October to June. One academic year
General aim of the subject
The student carry out, throughout the academic year and under the direct supervision of a tutor, a research project in the field. It constitutes a starting point in the scientific career preparing students for inclusion in PhD programs.
Professional specialization
Researchers specialized in molecular, cellular and/or clinical oncology aspects.

3.- Previous recommendations

Degree in Biology, Biochemistry, Biomedicine, Biotechnology or Pharmacy.

4.- Aims of the subject

To offer an suitable experimental framework, where students can acquire the theoretical-practical knowledge and technical skills necessary to choose and develop both independently and in collaboration a competitive scientific project in the field of cancer molecular biology.

5.- Contents

The student will choose one of the following research projects.

These themes of work will be evaluated and adapted every academic year according to the availability and supply of researchers.

RESEARCH PROJECT 2024/2025	RESEARCH GROUP
"Biological characterization of T- and NK-cell neoplasms"	Julia Almeida Parra
"Cancer epitranscriptomics"	Sandra Blanco Benavente

"Genomic stability: Regulation of replication and the DNA Damage Tolerance"	Andrés Avelino Bueno Núñez María Sacristán Martín
"Molecular mechanisms mediating tumour:stroma crosstalk"	M. Esther Castellano Sánchez
"Ribosome synthesis in normal and cancer cells"	Mercedes Dosil Castro
"Molecular characterization of resistance mechanisms to targeted therapies in lung cáncer" "Identification of novel therapeutic targets for KRAS-mutant lung cancer"	Matthias Drosten
"NanoMedicina en inmunoterapia y oncohematología"	Manuel Fuentes García
"Identification and validation of new oncogenic drivers in hematopoietic and solid tumors" "Development of new pharmacological strategies to block early oncogenic signaling proteins in cancer"	Xosé R. García Bustelo
"Hereditary cancer diagnosis. DNA repair and/or epigenetic modifiers in the treatment of cancer"	Rogelio González Sarmiento
"New treatments in hemopathies: from the laboratory to the clinic" "Role of the bone marrow microenvironment in the pathology of multiple myeloma" "Study of new therapeutic combinations and resistance mechanisms in multiple myeloma: targeted drugs and immunotherapies"	M Victoria Mateos Manteca Mercedes Garayoa Berrueta María Teresa Paíno Gómez
"Role of C3G in the biology of platelets and megakaryocytes. Understanding the role of C3G in hematopoiesis and hematopoietic stem cell (HSC) disorders"	Carmen Guerrero Arroyo
"Molecular Cytogenetics in Oncology" "NGS and Big Data in hematological malignancies"	Jesús María Hernández Rivas
"Mechanisms of hormone resistance and breast cancer"	Toni Hurtado
"Development and characterization of new murine models of chromosomal instability and their involvement in cancer, aging and fertility"	Elena Llano Cuadra Alberto Martín Pendás
"The Gab1 docking protein in cancer and its possible use as a therapeutic target"	Marina Holgado
"Molecular mechanisms regulating cell growth and division: implications in cancer and aging"	Sergio Moreno Pérez
"New strategies for treatment of non-angiogenic tumors and metastases"	José Manuel Muñoz Félix
"Characterization of the genetic alterations and signaling pathways involved in the clonal development and neoplastic transformation of B cells of subjects with clonal B lymphocytosis (MBL) vs patients with chronic lymphatic leukemia (LLC)"	Alberto Orfao de Matos Julia Almeida Parra Manuel Fuentes García

"Antibody-drug conjugates in cancer"	<u>Atanasio Pandiella</u> <u>Azucena Ésparis</u> <u>Ogando</u>
"Structural biology of cell adhesion and signaling"	<u>José María de Pereda</u> <u>Vega</u>
"Model-Informed Precision Dosing of anticancer drugs" "Population pharmacokinetics and dosage optimization strategies of anticancer drugs"	<u>Amparo Sánchez</u> <u>Navarro</u> <u>María José García</u> <u>Sánchez</u> <u>José Germán</u> <u>Sánchez Hernández</u> <u>Hinojal Zazo Gómez</u>
"Molecular and Genetic Determinants of cancer susceptibility, evolution, and treatment response"	<u>Jesús Pérez Losada</u>
"Role of endoglin in angiogenesis and tumor angiogenesis"	<u>Alicia Rodríguez</u> <u>Barbero</u> <u>Miguel Pericacho</u> <u>Bustos</u>
"Bioinformatics and Functional Genomics in Cancer: discovery of biomarkers, gene signatures and regulators in omic data from patients, with a focus on transcriptomic and single-cell data" "Bioinformatics and Computational Biology in Cancer: application of machine learning, deep learning and artificial intelligence to study prognosis, therapeutic response and resistance in cancer patients using omic data"	<u>Javier de las Rivas</u> <u>Sanz</u>
"Mechanisms responsible for clonal evolution with the aim of leukemia prevention"	<u>Isidro Sánchez García</u>
"Bone marrow normal and leukemic niche and immune-effector cells"	<u>Fermín Sánchez-Guijo</u> <u>Martín</u> <u>Sandra Muntión</u>
"Genome editing by CRISPR-Cas system technology: generation of new preclinical mouse models."	<u>Manuel A. Sánchez</u> <u>Martín</u>
"Novel RAS biology with therapeutic potential"	<u>David Santamaría</u>
"Structure and function of Ras oncogenes and their molecular regulators"	<u>Eugenio Santos de</u> <u>Dios</u>
"Role of TGFbeta signaling and EMT-TFs in the progression of hepatobiliary tumors" "Identification of new molecular targets for the treatment of hepatobiliary tumors"	<u>Javier Vaguero</u> <u>Rodríguez</u>
"Force generation and mechanotransduction during metastasis and tumor growth" "Mechanics of the tumor microenvironment and the anti-tumor immune response" "Mechanical determinants of cellular plasticity during tumorigenesis and virus infection".	<u>Miguel Vicente</u> <u>Manzanares</u>

6.- Skills to be acquired

Basic skills

- Capacity for analysis, global visions, synthesis and practical application of knowledge
- Understand the meaning and achieve of each of the basic experimental techniques in molecular biology in advancing knowledge of cancer.

Specific skills

- To acquire the technical skills necessary to develop a scientific project in the area.
- To develop the ability to design relevant experiments to confirm raised hypothesis.
- Students will be able to apply the scientific method to the experimental approaches that are used in cancer research.
- Know how to plan a clinical trial: susceptible population, inclusion and exclusion criteria, efficacy and toxicity assessment methods.
- Critical thinking and understanding the importance of multidisciplinary research for the knowledge of cancer.

7.- Teaching methodology

The eminently practical nature of this mandatory subject implies that students carry out their projects in the laboratory under the direct supervision and teaching of their researchers

8.- Estimated learning time

	Hours tutored by the teacher		Individual work (hours)	TOTAL HOURS
	Attendance required (hours)	Distance learning (hours)		
Lectures				
Practices	- In classroom			
	- In laboratory	200		200
	- In computer classroom			
	- Countryside			
	- Visualization classroom			
Seminars				
Work presentations and debates				
Tutorials	20			20
Online activities				
Work preparation			80	80
Other activities				
Exams - evaluation				
TOTAL	220		80	300

9.- Materials

Books
Other bibliographical, electronic references or any other type of resource

10.- Assessment

Assessments on the performance of the student
<ul style="list-style-type: none"> - Attendance at the designated laboratory will be evaluated always in accordance with the work program proposed by the tutor. (10% of the final grade) - Ability to learn the laboratory techniques necessary to carry out the practical work assigned by the subject's tutor. (30% of the final grade) - Professional interaction of the students with the members of the assigned laboratory and their ability to carry out teamwork. Attendance and capacity for interaction and participation in the seminars of the assigned group, understanding that both participation and the establishment of a critical dialogue are evaluable. (30% of the final grade) - Ability to design and elaborate relevant experiments autonomously, as well as their ability to select scientific works and assess their contribution to the research topic; it is therefore about evaluating the maturity and critical capacity acquired by the student. (30% of the final grade).