# Theme: Cellular and Molecular Biology of Cancer

## Keynote Session: From molecular oncology to personalized therapies: Changes in the clinical practice
- **Theme:** Keynote Session
- **Topic:** From molecular oncology to personalized therapies: Changes in the clinical practice
- **Professor:** Mariano Barbacid

## Eukaryotic Cell
- **Theme:** Eukaryotic cell
- **Topic:** The carcinogenesis process. Normal cells vs tumor cells
- **Professor:** Miguel Lafarga

## The Human Genome: Genes and Genetic Code
- **Theme:** The human genome: genes and genetic code
- **Professor:** José Fernández Piqueras

## Regulation of Gene Expression
- **Theme:** Regulation of gene expression
- **Professor:** Miguel Fernandez

## Mitogen Signal Transduction, RET and the Multiple Endocrine Neoplasia
- **Theme:** Mitogen signal transduction, RET and the multiple endocrine neoplasia
- **Professor:** José María Rojas

## Genes and Cancer I: Proto-oncogenes and Oncogenes: Discovering Viral and Human Oncogenes
- **Theme:** Genes and Cancer I
- **Topic:** Proto-oncogenes and oncogenes: discovering viral and human oncogenes
- **Professor:** Alberto Muñoz

## Genes and Cancer II: Suppressor Genes and Genetic Predisposition to Cancer
- **Theme:** Genes and Cancer II
- **Professor:** José Fernández Piqueras

## Gene Suppressor APC and the Wnt/Beta-catenin Pathway
- **Theme:** Gene suppressor APC and the Wnt/beta-catenin pathway
- **Professor:** Alberto Muñoz

## The BRCA Genes in Breast Cancer
- **Theme:** The BRCA genes in breast cancer
- **Professor:** Javier Benitez

## Oncogene RAS Family, Its Adaptors and Effectors
- **Theme:** Oncogene RAS family, its adaptors and effectors
- **Professor:** Marcos Malumbres

## The PI3K-PTEN-AKT-mTOR Pathway: Survival and Cell Growth
- **Theme:** The PI3K-PTEN-AKT-mTOR pathway: survival and cell growth
- **Professor:** Federico Mayor

## Fusion Gene BCR-ABL and Other Fusion Oncogenes in Myeloid Leukemia
- **Theme:** Fusion gene BCR-ABL and other fusion oncogenes in myeloid leukemia
- **Professor:** Juan Cruz Cigudosa

## The MYC Gene Family
- **Theme:** The MYC gene family
- **Professor:** Javier León

## Oncogenes That Code for Growth Factors and Tyrosine-Kinase Receptors
- **Theme:** Oncogenes that code for growth factors and tyrosine-kinase receptors
- **Professor:** Joaquin Arribas

## Mutations and DNA Repair Mechanism
- **Theme:** Mutations and DNA repair mechanism
- **Professor:** Luis Blanco

## DNA Repair Genes, Mutator Phenotype and Epigenetics
- **Theme:** DNA repair genes. Mutator phenotype and epigenetics
- **Professor:** Manuel Perucho

## TGF-beta: Carcinogenesis Effects
- **Theme:** TGF-beta: carcinogenesis effects
- **Professor:** Isabel Fabregat

## Hedgehog Pathway and Cancerogenesis
- **Theme:** Hedgehog pathway and cancerogenesis
- **Professor:** Miguel Quintanilla

## Tumor Suppressor and Senescence
- **Theme:** Tumor suppressor and senescence
- **Professor:** Manuel Serrano

## The TGF-β3: Structure and Biological Activity. The TGF-β3-CDK1-MAPK Pathway
- **Theme:** The gene TPS3: structure and biological activity. The TPS3-MDM2-1RF pathway
- **Professor:** Ignacio Palmero

## TP53: Mutations and Their Effects
- **Theme:** TP53: mutations and their effects
- **Professor:** Ignacio Palmero

## The Notch Pathway in Cancerogenesis
- **Theme:** The Notch pathway in cancerogenesis
- **Professor:** Isabel Fariñas

## Apoptosis, Necrosis, Autophagy and Cancer
- **Theme:** Apoptosis, necrosis, autophagy and cancer
- **Professor:** Joan Gil

## Telomerase and Cancer
- **Theme:** Telomerase and cancer
- **Professor:** María Blasco

## Hypoxia and Cancer. Suppressor Gene VHL
- **Theme:** Hypoxia and Cancer. Suppressor gene VHL
- **Professor:** Manuel Ortiz de Landázuri

## Stem Cells and Cancer Stem Cells (CSC). Cell Reprogramming: iPS
- **Theme:** Stem cells and Cancer stem cells (CSC). Cell reprogramming: iPS
- **Professor:** Monika López Barahona

## Stem Cells, Development and Cancer
- **Theme:** Stem cells, development and cancer
- **Professor:** Pablo Menéndez

## Molecular Basis of Metastasis
- **Theme:** Molecular basis of metastasis
- **Professor:** Carlos López Otín

## TGF-beta and Gliomas
- **Theme:** TGF-beta and gliomas
- **Professor:** Joan Seoane

## How the Tumors Evoke the Immune Response
- **Theme:** How the tumors evade the immune response
- **Professor:** Manuel Fresno

## Inflammation and Cancer
- **Theme:** Inflammation and Cancer
- **Professor:** Manuel Fresno

## Chemokines and Cancer
- **Theme:** Chemokines and cancer
- **Professor:** Santos Mañez

## Cell Adhesion and Cancer: E-cadherin, Epithelium-Mesenchyme Transition
- **Theme:** Cell adhesion and cancer: E-cadherin, Epithelium-Mesenchyme transition
- **Professor:** María Jesús Larrazábal

## Cell Migration: Integrins, c-Met
- **Theme:** Cell migration: Integrins, c-MET
- **Professor:** Alberto Muñoz

## Cannabinoids and Cancer
- **Theme:** Cannabinoids and cancer
- **Professor:** Manuel Guzmán

## Angiogenesis and Tumoral Lymphangiogenesis
- **Theme:** Angiogenesis and tumoral lymphangiogenesis
- **Professor:** Benilde Jimenez

## Mechanism of Action of the Antiangiogenic Agents
- **Theme:** Mechanism of action of the antiangiogenic agents
- **Professor:** Benilde Jimenez

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Note: The academic content is preliminary and can be subject to changes.
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## Theme: MOLECULAR ONCOLOGY

### Agents related to cancer risk
- Carcinogenic risk factors. Diet and Tobacco. (Carlos A. González)
- Alcohol and carcinogenesis. Molecular Mechanisms (Fernando Granado)
- Virus and other infectious agents, and Cancer (Silvia de Sanjosé)
- Human exposition to endocrine disruptors and cancer (Nicolás Olea)
- Challenges and opportunities in the integration of omics data in epidemiological studies (Nuria Malats)
- Mechanism of estrogen action (Angel Nadal)
- Carcinogens, genetic profiling (Francisco Real)

### Introduction to familial cancer. Entities with demonstrated mendelian inheritance
- Genetic counseling in familial cancer. Diagnostic problems (Miguel Urioste)

### Pharmacology and antitumoral agents
- Introduction to drug discovery and development (Fernando Peláez)
- Pharmacogenetic and Pharmacogenomic in lung carcinoma model (Miquel Tarón)
- Histopathology and pharmacodynamic in the treatment with molecular design drugs (Federico Rojo)
- Engineering antibodies for therapeutic use (Luis Ángel Fernández Herrero)
- Treatment with immunostimulatory antibodies (Ignacio Melero)
- Genetic Therapy: antitumoral virotherapy in the clinic (Javier García Castro)
- Genotoxic nanoconjugates against metastasis initiating cells in colorectal cancer (Ramón Mangues)
- TeraBiological therapies in the pre-op treatment breast cancer (José Manuel López Vega)
- Potential of the cell cycle regulators in the design of therapeutic drugs (Marcos Malumbres)
- Vitamin D and Cancer: Mechanism and Possibility of clinical use (Alberto Muñoz)
- Discover, validate and transfer to the clinic therapeutic targets in sarcomas (Enrique de Álava)
- Role of the antiangiogenic therapy in tumoral progression and metastasis (Oriol Casanovas)

### Molecular development and clinical implications of prostate cancer
- Apoptosis regulation in chronic lymphatic leukemia. New therapeutic targets. (Joan Gil)
- Embryonic reprogramming and Cancer (Manuel Serrano)
- Molecular biology behind the modulation of cellular radiosensibility (Jesus Romero)
- Drugs blocking oncogenic stimulation (Pere Gascón)
- New concepts for the design of antitumoral inhibitors of the Ras-ERK pathway (Piero Crespo)
- Extracellular matrix, tumoral stroma and chaperones as drug targets (Luis Paz Ares)
- New molecular therapies in pancreatic cancer (Manuel Hidalgo)
- Energy protein metabolism: Rising targets in antitumoral therapy (José Cuezva)

### Methodology and clinical research application
- Methodology and clinical research application (José Javier García)
- Use of biological material in clinical protocols. Design of diagnostic tools. (Gabriel Capellá)

### Available from April to June 2019

#### Module III Exam (Retake)
- July, 16th 2019
- July, 23rd 2019