

Title of course: *Basic Biology of the Cell for Emerging Therapies*
BBC-ET

Number of hours	60	Semester : Both
Number of ECTS	6	
teaching staff	B Ségui, JC Pagès, C Clavel, N Jonca, L Nogueira, N Pell-Vidal, D Vieles-Marais, Recherche : N Gaudenzio, L Basso, L Casteilla, A Carrière, T Levade, L Orlando, D Vieles-Marais, S Giuriato, O Calvayrac, V Lobjois, PA Apoil, B Puissant G. Favre, I Ader, JF Arnal	
Aims	To give the molecular and cellular bases to understand the therapeutic evolutions with a focus on examples taken from the field of oncology and aging. Emphasis will be put on basic knowledge by showing how it is crucial to understand the field of innovative therapies.	
Content	<p>A) Structural elements necessary to understand molecular alterations in cancer and aging:</p> <ul style="list-style-type: none"> - Structural organization of cells: <ul style="list-style-type: none"> • Nuclei, chromatin, genomes (L Orlando) 2H • Functional Genomics: expression and regulation (JC Pagès) 1H • Cellular compartments: structural and functional continuity (D Vieles-Marais) 1H • Cellular metabolic and links between metabolisms and cell biology control (A. Carrière; T Levade) 2H • Physiological issues for the biodisponibility of dioxygen (JF Arnal) 1H • The cells in their environment: ECM-Cytoskeleton, and local network vesicular traffic (N Jonca) 2H - Functional potentials of a cell according to the conditions of its tissue environment: <ul style="list-style-type: none"> • Cellular differentiation and plasticity (L Casteilla) 2H • Cellular senescence, proliferation (C Clavel) 2H • Cell death (B Ségui) 2H • Autophagy (S Giuriato) 1H - Cells within organisms: <ul style="list-style-type: none"> • Macrophages: gene expression and differentiation (C Clavel) 2H • Basics on immune responses (B Segui) 1,5H • Impact of ageing on immune responses (PA Apoil, B Puissant) 1,5H • Anticancer immune responses (B Segui) 1H • Sensory nervous system: localization, cell diversity and primary function (N Gaudenzio L Basso) 2H • Neuro-immune interactions during pathophysiological processes (N Gaudenzio L Basso) 2H • Neurodegeneration (L Nogueira) 2H • Cellular Imaging (V Lobjois) 1H - Example and principles for the development of therapeutic tools: <ul style="list-style-type: none"> • From pathophysiology to targeted therapies in autoimmune diseases (G Serre) 2H 	

	<ul style="list-style-type: none"> • Cancer therapies: finding the target, building the arrow (G Favre, O Calvayrac) 2H • Cell renewal: technical “control” of differentiation (JC Pagès) 1H • Genetic diversity of tumoral cells and resistance or escape to therapies: Darwin vs Lamarck again? (JE Sarry) 2H <p>Enseignement pratique-Practical Course (24H):</p> <ul style="list-style-type: none"> - Scientific report analysis: 2 students 1 supervisor (8 binomes) - Scientific report from a research team (4 presentations) - Workshop on ethics in biological science (Half-day course in common with Care) - International Research presentation
Assessment	<ul style="list-style-type: none"> - 1st Session <ul style="list-style-type: none"> ○ Continuous monitoring by article analysis: 25 % ○ Terminal control (written): 50 % ○ Terminal control (oral): 25 % <ul style="list-style-type: none"> ▪ Article analysis: two students present an article they received at least 15 days ahead, and one coordinator fills a grid to build the notation, during presentation and question answering. ▪ Short written question to evaluate knowledge and understanding of the Theoretical Courses: document analysis and questions. All documents are allowed during the exam. ▪ Oral: two mentors raising questions on a short document prepared during 15 mn. - 2nd Session <ul style="list-style-type: none"> ○ Article analysis: First round evaluation conserved ○ Terminal control (written): depending on the initial: <10/20 : written; >10/20 evaluation conserved <p>Catch-up oral</p>
Pre-requisites	Students from L3 in science, in engineering, veterinarian, pharmacy, medical, odontology
Keywords	Molecular approaches to understand OMics; Bases and opportunity in Cell imaging; Bioinformatics approaches to metadata-integration and modeling; Cellular interactions (immunology); Personalized medicine
FTLV (Y/N)	YES
Skills	Fluent in English, basic knowledge in biology