| Teaching Guide | | | | |
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| Identifying Data | | | | 2016/17 |
| Subject (*) | Bioloxía Celular Avanzada | | Code | 610441003 |
| Study programme | Mestrado Universitario en Bioloxía Molecular , Celular e Xenética | | | |
| Descriptors | | | | |
| Cycle | Period | Year | Type | Credits |
| Official Master's Degree | 1st four-month period | First | Obligatoria | 3 |
| Language | SpanishGalician | | | |
| Teaching method | Face-to-face | | | |
| Prerequisites | | | | |
| Department | Bioloxía Celular e Molecular | | | |
| Coordinador | Yañez Sanchez, Julian | E-mail | julian.yanez@udc.es | |
| Lecturers | Díaz Prado, María Luz<br>Manso Revilla, Maria Jesus<br>Yañez Sanchez, Julian | E-mail | luz.diaz@udc.es<br>maria.jesus.manso@udc.es<br>julian.yanez@udc.es | |
| Web | | | | |
| General description | Cell biology as a current discipline has grown and matured significantly so that its conceptual boundaries are often diffuse and difficult to define. Thus, Cytology, Biochemistry, Molecular Biology, Genetics and Cell Physiology cell overlap in many respects. In fact, any substantial advance in either of these areas involves using methodologies typified as specific in one or more areas.<br>This course focuses on the structure and function of cellular components with a holistic view of the interactions between these components to ensure proper functioning of the cell. We realize that it is not possible to cover in a single course all the continuous advances in depth, so we selected aspects of current relevance to give an idea of the complexity underlying cellular processes.<br>Since this is an advanced course, it is assumed that students have basic knowledge of cell biology, genetics, physiology, biochemistry and molecular biology. | | | |

| Study programme competences | |
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| Code | Study programme competences |
| A1 | Skills of using usual techniques and instruments in the cellular, biological and molecular research: that are able to use techniques and instruments as well as understanding potentials of their uses and applications. |
| A2 | Skills of working in a sure way in the laboratories knowing operation handbooks and actions to avoid incidents of risk. |
| A6 | Skills of understanding the functioning of cells through the structural organization, biochemistry, gene expression and genetic variability. |
| A7 | Skills of knowing and analyzing specific cellular systems as stem cells, nerve cells, cells of the immune system, or other cells related to several pathologies. |
| A13 | Skills to become a professional in health, pharmacy, veterinary, animal production, biotechnology or food sectors. |
| B5 | Correct oral and written communication on scientific topics in the native language and at least in another International diffusion language. |
| B9 | Skills of preparation, show and defense of a work. |
| C1 | Skills of expressing correctly, so much of oral form as written, in the official languages of the autonomous region. |

| Learning outcomes | | | |
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| Learning outcomes | Study programme competences | | |
| Skills of understanding the functioning of cells through the structural organization. | AR6<br>AR7 | BR5<br>BR9 | CC1 |
| Skills to apply immunohistochemical techniques to the study of cell components | AR1<br>AR2<br>AR13 | | |

| Contents |
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| Topic | Sub-topic |
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| Introduction to cell | Cell Domains and the origin of multicellularity.<br>Integrative view of the eukaryote cell |
| Structure and dynamics of the cell nucleus | Structure of nuclear envelope<br>Nucleocytoplasmic traffic.<br>Cell nucleus organization: chromatinic territories and nuclear subdomains. |
| Biogenesis, trafficking and functions of the cell endomembrane system | Structure and membrane domains.<br>Membrane compartments and vesicular trafficking.<br>Traffic RE-Golgi complex.<br>Endosomes and endocytosis.<br>Traffic between the Golgi complex and endosomes.<br>The secretory pathway of the Golgi complex: conventional and unconventional exocytosis.<br>Lipid trafficking between compartments.<br>Post-translational targeting of cytosolic proteins to organelles.<br>Degradation of cellular components. |
| Cytoskeleton and cell dynamic. | Microtubules and associated proteins.<br>Microtubule complex structures.<br>Microfilaments and associated proteins.<br>Cell motility and contractile systems.<br>Cytoskeleton and cytokinesis.<br>Intermediate filaments. Septins. |
| Interactions cell to cell and cell to extracellular matrix | Cell adhesion and junctions<br>Extracellular matrix molecules<br>Pathological alterations of the extracellular matrix. |

| Planning | | | | |
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| Methodologies / tests | Competencies | Ordinary class hours | Student?s personal work hours | Total hours |
| Guest lecture / keynote speech | A6 | 8 | 16 | 24 |
| Document analysis | A6 B9 B5 C1 | 4 | 12 | 16 |
| Laboratory practice | A1 A2 | 10 | 20 | 30 |
| Mixed objective/subjective test | A6 | 2.5 | 0 | 2.5 |
| Personalized attention | | 1 | 0 | 1 |
| (*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. | | | | |

| Methodologies | |
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| Methodologies | Description |
| Guest lecture / keynote speech | Face sessions of approximately 60 minutes on the contents of the program. For a full exploitation of these sessions, it is recommended that students have previously read on their own fundamental aspects of these topics in the recommended texts. |
| Document analysis | It will consist of individual reading of recent research articles or reviews in Cell Biology designated by the lecturer complementing the given lectures. In classroom sessions each student will present a brief summary in limited time and will provide the basis for a posterior general discussion. |
| Laboratory practice | It will consist of the application of immunohistochemical methods for the analysis and study of certain cellular structures or components. |
| Mixed objective/subjective test | It will consist of an exam with choice questions and/or short questions on the contents of the topic treated in lectures and seminars. |

| Personalized attention | |
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| **Methodologies** | **Description** |
| Guest lecture / keynote speech | Students will be attended personally for any question raised along the course |

| Assessment | | | |
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| **Methodologies** | **Competencies** | **Description** | **Qualification** |
| Document analysis | A6 B9 B5 C1 | The degree of understanding of the subject and its presentation in the indicated time so as original graphical abstract will be assessed. Active participation in the discussion of presentations is also valued. | 30 |
| Mixed objective/subjective test | A6 | It will consist of short answer and multiple choice questions on the contents of the topics covered in the keynote sessions and seminars. | 70 |

| Assessment comments |
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| Semipresential students may substitute attendance of seminars (Journal Club) by a single written review paper on some aspect related to the syllabus and agreed with the lecturer.<br><br>Exceptionally,<br>under justified reasons (part-time learning or particular learning circumstances),<br>in case the student could not follow the assessment activities, the teacher can<br>adopt appropriate measures aimed not to hurt their score.<br><br>In the second call (July) only the results of the examination will be<br>taken into account for final qualification<br>Honors will be preferably granted among students presented in the first call. |

| Sources of information | |
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| **Basic** | - Pollard, T.D; Earnshaw WC (2002, 2008). Cell Biology. Saunders<br>- Alberts, B.; Johnson A.; Lewis, J.; Raff, M.; Roberts, R. & Walter, P (2008). Molecular Biology of the cell. Garland<br><br /> |
| **Complementary** | - Lodish, H.; Berk, A.; Zypursky, S.; Matsudaira, P.; Baltimore, D.; Darnell, J. (2013). Molecular cell biology. Macmillan<br>Enlaces de interés/ Links of interest:IBIOSEMINARS Virtual cell animation collectionSaylor Academy: Cell biology lectures |

| Recommendations |
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| **Subjects that it is recommended to have taken before** |
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| **Subjects that are recommended to be taken simultaneously** |
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| **Subjects that continue the syllabus** |
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| **Other comments** |
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(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.