



| Teaching Guide           |  |        |  |         |
|--------------------------|--|--------|--|---------|
| Identifying Data         |  |        |  | 2022/23 |
| Subject (*)              | Proteomics   | Code   | 610441014  |         |
| Study programme          | Máster Universitario en Bioloxía Molecular, Celular e Xenética   |        |  |         |
| Descriptors              |  |        |  |         |
| Cycle                    | Period   | Year   | Type   | Credits |
| Official Master's Degree | 2nd four-month period  | First  | Optional   | 3       |
| Language                 | SpanishGalicianEnglish   |        |  |         |
| Teaching method          | Face-to-face   |        |  |         |
| Prerequisites            |  |        |  |         |
| Department               | BioloxíaDepartamento profesorado máster  |        |  |         |
| Coordinador              | Cerdan Villanueva, María Esperanza   | E-mail | esper.cerdan@udc.es  |         |
| Lecturers                | Calamia , Valentina<br>Cerdan Villanueva, Maria Esperanza<br>Fernández Puente, Patricia<br>Lourido Salas, Lucía María<br>Ruiz Romero, Cristina   | E-mail | valentina.calamia@sergas.es<br>esper.cerdan@udc.es<br>patricia.fernandez.puente@udc.es<br>l.lourido@udc.es<br>cristina.ruiz.romero@correo.udc.es |         |
| Web                      |  |        |  |         |
| General description      | <p>It is coordinated by María Esperanza Cerdán Villanueva (esper.cerdan@udc.es) and is taught by INIBIC teachers (contact: cristina.ruiz.romero@sergas.es)</p> <p>The aim of this subject is to train the student to:</p> <ul style="list-style-type: none"> <li>.-Understand the basic techniques of working in proteomics</li> <li>.-Obtain and manage protein samples</li> <li>.-Know the techniques for the separation and massive detection of proteins</li> <li>.-Understand large-scale proteomic data analysis methods</li> <li>.-Know the applications of proteomics in basic, applied and clinical research</li> <li>.-The critical reading and understanding of scientific publications in the field of proteomics</li> </ul> |        |  |         |

| Study programme competences / results |  |
|---------------------------------------|--|
| Code                                  | Study programme competences / results  |
| A2                                    | 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. |
| A3                                    | Skills of understanding the functioning of cells through the structural organization, biochemistry, gene expression and genetic variability.   |
| A9                                    | Skills of understanding the structure and dynamics of proteins to individual and proteomic level, as well as the techniques that are necessary to analyze them and to study their interactions with other biomolecules.  |
| B1                                    | Analysis skills to understand biological problems in connection with the Molecular and Cellular Biology and Genetics.  |
| B3                                    | Skills of management of the information: that are able to gather and to understand relevant information and results, obtaining conclusions and to prepare reasoned reports on scientific and biotechnological questions  |
| C1                                    | Ability to express oneself correctly, both orally and in writing, in the official languages of the autonomous community  |
| C2                                    | Ability to know and use appropriately the technical terminology of the field of knowledge of the master, in the native language and in English, as a language of international diffusion in this field                   |

| Learning outcomes |                                       |
|-------------------|---------------------------------------|
| Learning outcomes | Study programme competences / results |
|                   |                                       |



|  |     |     |     |
|--|-----|-----|-----|
| In this course knowledge and skills about the extraction, purification and characterization of proteins from biological systems is acquired. | AR2 | BR1 | CC1 |
|  | AR3 | BR3 | CC2 |
|  | AR9 |     |     |

| Contents   |   |
|------------|---|
| Topic      | Sub-topic   |
| Proteomics | 1.-The concept of proteomics and its applications. 2.-Preparation of protein extracts and protein solubilization.<br>3.-Proteomics by two-dimensional electrophoresis. 4.-Handling two-dimensional proteomics bioinformatics programs.<br>5.-Identification and characterization of proteins in micro-scale.<br>Differential expression proteomics: DIGE.<br>6.-Protein expression and protein chips.<br>7.-Protein identification by peptide mass fingerprinting.<br>8.-Tandem mass spectrometry (MS/MS): peptide sequencing.<br>9.- Databases and search programs for assisted protein identification by MS.<br>10.-Proteomics differential expression without gel: ICAT, iTRAQ, SILAC.<br>11.-Applications of proteomics in the field of Biomedicine.<br>12.-The human proteome. |

| Planning                       |                        |                                      |                               |             |
|--------------------------------|------------------------|--------------------------------------|-------------------------------|-------------|
| Methodologies / tests          | Competencies / Results | Teaching hours (in-person & virtual) | Student?s personal work hours | Total hours |
| Guest lecture / keynote speech | A9 C2                  | 9                                    | 18                            | 27          |
| Laboratory practice            | A2 A3 A9 B1 B3 C1      | 9                                    | 0                             | 9           |
| Objective test                 | A2 A3 A9 B1 B3         | 2                                    | 37                            | 39          |
| Personalized attention         |                        | 0                                    |                               | 0           |

(\*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

| Methodologies                  |   |
|--------------------------------|---|
| Methodologies                  | Description                                       |
| Guest lecture / keynote speech | Magistral exposures                               |
| Laboratory practice            | A guided tour of techniques at the Proteomic unit |
| Objective test                 | Questionary about the program content             |

| Personalized attention         |  |
|--------------------------------|--|
| Methodologies                  | Description  |
| Guest lecture / keynote speech | Students with part-time dedication or waiver of presence should contact the teachers of the subject in the early going to establish a schedule of activities to acquire and evaluate in a complementary way the competences. |
| Laboratory practice            |  |

| Assessment    |                        |             |               |
|---------------|------------------------|-------------|---------------|
| Methodologies | Competencies / Results | Description | Qualification |
|               |                        |             |               |



|                                |                   |                                 |    |
|--------------------------------|-------------------|---------------------------------|----|
| Guest lecture / keynote speech | A9 C2             | Attendance and participation    | 25 |
| Laboratory practice            | A2 A3 A9 B1 B3 C1 | Attendance and participation    | 25 |
| Objective test                 | A2 A3 A9 B1 B3    | Multiple options selection/test | 50 |

#### Assessment comments

Students with part-time dedication or waiver attendance may choose to be evaluated in a final exam if they do not qualify for continuous evaluation.

#### Sources of information

|                      |   |
|----------------------|---|
| <b>Basic</b>         | Se especifican en Moodle junto co resto dos materiais a utilizar. Se especifican en Moodle junto co resto dos materiais a utilizar. |
| <b>Complementary</b> | Se especificarán en la aplicación de la materia   |

#### Recommendations

Subjects that it is recommended to have taken before

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Other comments

(\*)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.