

## MOLECULAR PATHOLOGY

MODULE	SUBJECT	YEAR	TERM	CREDITS	TYPE
Curricular complements	Molecular Pathology	3,4, 5	1	6	Elective
<b>PROFESSORS AND GROUPS</b>			<b>CONTACT ADDRESS</b>		
<p>Sánchez Pozo, Antonio (Group A)</p> <p>Landeira Frías, David (Group E )</p> <ul style="list-style-type: none"> <li>• Suarez García, Antonio (Laboratory)</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>			<p>Sánchez Pozo, Antonio Dpt. de Bioquímica y Biología Molecular 2, Facultad de Farmacia. Tlf: 958-243842 Email: <a href="mailto:sanchezp@ugr.es">sanchezp@ugr.es</a> Web: <a href="http://www.ugr.es/~sanchezp/asp.htm">http://www.ugr.es/~sanchezp/asp.htm</a></p> <p>Landeira Frías, David Dpt. de Bioquímica y Biología Molecular 2 and Centro de Genómica e Investigación Oncológica (GENYO)Pfizer-Junta de Andalucía-Universidad de Granada. Parque Tecnológico de la Salud Av. de la Ilustración 114.18016   Granada   España Tlf: <a href="tel:+34958715500">+34 958 715 500</a> (ext 136) Email: <a href="mailto:davidlandeira@ugr.es">davidlandeira@ugr.es</a> Web: <a href="http://www.landeiralab.ugr.es">www.landeiralab.ugr.es</a></p> <p>Suárez García, Antonio Dpt. de Bioquímica y Biología Molecular 2, Facultad de Farmacia. Centro de Investigación Biomédica. Tlf: 958-243833 9582-241000/20318 Email: <a href="mailto:asuarez@ugr.es">asuarez@ugr.es</a> Web:</p>		
			<b>TUTORING HOURS</b>		
			<p>By appointment</p> <p>Please, send an e-mail indicating the reason for the consult.</p>		



---

DEGREE	OTHERS
Pharmacy	All degrees in the Health Sciences Area, Biochemistry and Biotechnology.



*ugr* | Universidad  
de Granada

INFORMACIÓN SOBRE TITULACIONES DE LA UGR  
<http://grados.ugr.es>

<p><b>REQUISITES and RECOMMENDATIONS</b></p> <ul style="list-style-type: none"> <li>• Have an adequate level of English (European level B1, B2). Group A will be taught totally in English</li> <li>• Adequate skills of office software and managing scientific information.</li> <li>• Adequate knowledge of the relevant aspects of the Human Genome, Transcriptome, Epigenome. Proteome. System Biology.</li> <li>• It is recommended to have passed the modules of Biochemistry Metabolic and Structural, Biotechnology, Cellular Physiology I and II and Immunology.</li> </ul>
<p><b>MAIN TOPICS</b></p> <p>Genetic Diseases. Methodology in Molecular Pathology. Polymorphism and mutations. Disorders in the synthesis, folding, secretion and degradation of proteins. Genetic disorders responsible for changes in proliferation and cell death. Inflammation. Molecular Diagnosis of genes of susceptibility.</p>
<p><b>COMPETENCES</b></p> <p>The module will contribute to the development of the general competences of the degree in Pharmacy and the specific competence: knowing and understanding the structure and function of the human body, as well as the general mechanisms of disease, molecular, structural and functional alterations and expression syndromes and therapeutic tools for restoring health.</p>
<p><b>MAIN LEARNING OUTCOMES</b></p> <ul style="list-style-type: none"> <li>• Understanding the genetic basis of the various types of diseases.</li> <li>• Knowledge of the methodology for the diagnosis, monitoring, and research of diseases.</li> <li>• Acquire basic skills of laboratory.</li> </ul>

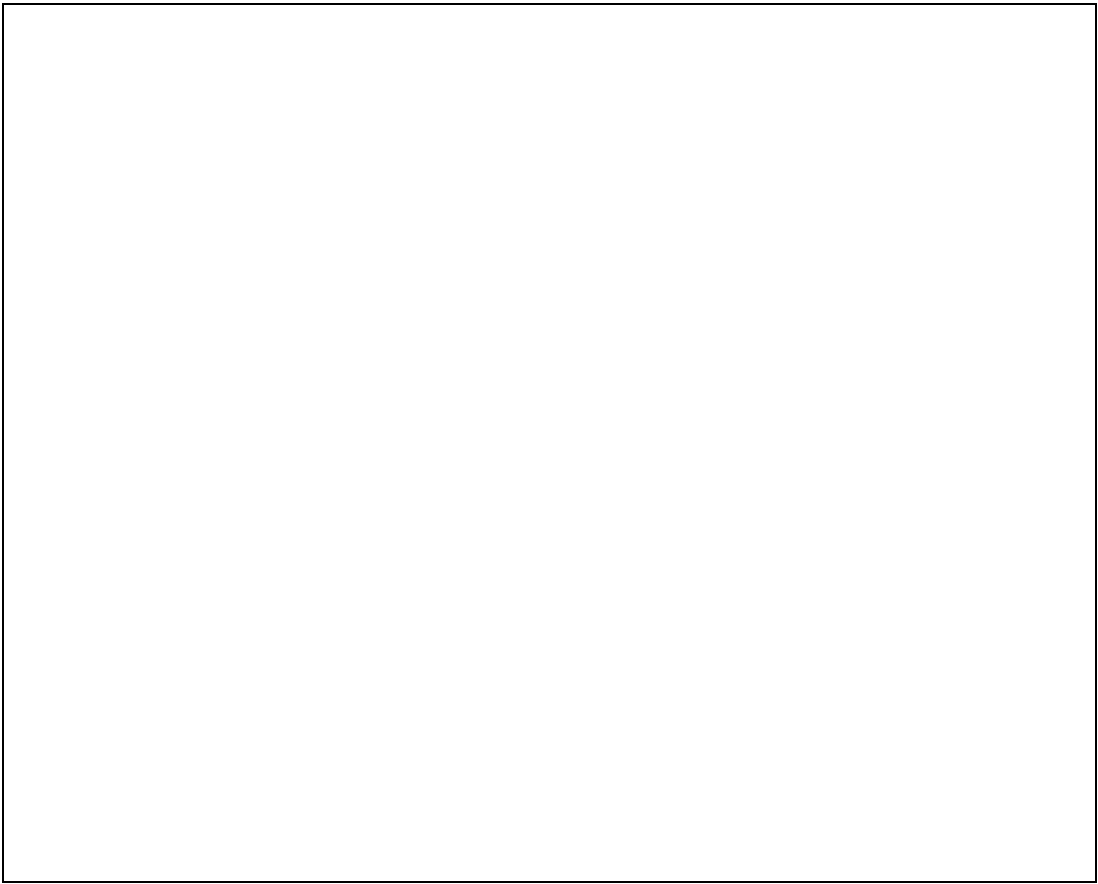


- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

## SYLLABUS

- **MOLECULAR BASES IN PATHOLOGY:** Genetic variation, including DNA repair. Genetic regulation of gene expression and epigenetics. Genotype-Phenotype correlations, monogenic and complex diseases. Inheritance patterns, phenotype variability and allele frequencies in populations. Estimated hours: 10
- **MOLECULAR PATHOLOGY OF SELECTED HUMAN DISEASES** (to be selected according with students interests). Examples: Cancer. Hypercholesterolemia. Phenylketonuria. Familial Mitochondrial diseases. Gaucher's disease. Diseases of peroxisomes. Cystic fibrosis. Cystinuria. Muscular Dystrophies. Immunodeficiency deficit of adenosine deaminase. Alzheimer's. Estimated hours: 20.
- **PRINCIPLES AND PRACTICE OF MOLECULAR PATHOLOGY:** Molecular diagnostics. Genetic counselling and social and ethical considerations. Gene and cell therapy. Pharmacogenomics and Pharmacogenetics testing in personalized Medicine. Estimated hours: 10
- **LABORATORY PRACTICE:** Determining the presence of polymorphism - 265TC (rs5082) in the APOA2 in genomic DNA gene. Estimated hours: 15





*ugr*

Universidad  
de Granada

INFORMACIÓN SOBRE TITULACIONES DE LA UGR  
<http://grados.ugr.es>

---

<b>BIBLIOGRAPHY</b>
Text Book <ul style="list-style-type: none"><li>Genetics and Genomics in Medicine. T. Strachan, J Goodship, P. Chinnery. Garland Science 2015</li></ul> Reference Bibliography <ul style="list-style-type: none"><li>The Metabolic Basis of Inherited Disease. Scriver et al. McGraw-Hill, 7th Ed, 2008</li><li>Molecular Pathology. The Molecular Basis of Human Disease. W.B. Coleman &amp; G.J Tsongalis. Academic Press 2009.</li><li>Human Molecular Genetics. Strachan y Read. 4ª Ed. Garland Science, 2011.</li></ul>
<b>LINKS</b>
<a href="http://www.sebbm.es/web/es/">http://www.sebbm.es/web/es/</a> <a href="http://www.seqc.es/">http://www.seqc.es/</a> <a href="https://www.ncbi.nlm.nih.gov/pubmed/clinical">https://www.ncbi.nlm.nih.gov/pubmed/clinical</a> <a href="http://www.omim.org/">http://www.omim.org/</a> <a href="http://sabiosciences.com/seminarlist.php?target=archive">http://sabiosciences.com/seminarlist.php?target=archive</a>
<b>TEACHING METHODOLOGY</b>



---

**Methodology:** Active learning.

Students are actively engaged in the learning process rather than “passively” absorbing lectures. Active learning involves reading, writing, discussion, and engagement in solving problems, analysis, synthesis, and evaluation.

**Activities:**

- Lectures based on a textbook.
- Extensive review of information (see links).
- Group discussion. Forums will be open in PRADO2 for each subject developed at class. In each forum the student has to describe in terms of competences what he/she has learnt and discuss in the group when requested.
- Case reviews (seminars), selected and presented by students
- Laboratory practical classes: compulsory attendance and will take place in 5 sessions of 3 hours, under the supervision of a Professor.
- Collective tutoring: reviewing the overall work of the students.
- Personalized tutoring on demand.





*ugr*

Universidad  
de Granada

INFORMACIÓN SOBRE TITULACIONES DE LA UGR  
<http://grados.ugr.es>



--

**STUDENT WORKLOAD**

This guide has been built according to the academic calendar and prior knowledge that is supposed to have students. Teachers will try to adapt to the different incidents through the planned meetings to homogenize the teaching, so the schedule will experience slight changes, always in order to guarantee the quality of teaching.

Fº TERM	TOPICS	CONTACT HOURS						AUTONOMOUS WORK			
		LECTURES	LABORATORY	SEMINARS	COLLECTIVE TUTORING	EXAMS	ETC.	TUTORIALS INDIVIDUALS (HRS)	STUDY AND INDIVIDUAL WORK (HRS)	WORK IN GROUP (HRS)	ETC.
<b>hours</b>		20	15	20	2	3		20	60	10	

LECTURES AND SEMINARS: Mondays, Tuesdays and Thursdays 9:30h (Group A) or 17h (Group E).

Lectures: Sep-Oct; Seminars: Nov-Dec

LABORATORY: To be determined by the Department

COLLECTIVE TUTORING: Jan

EXAMS: Entry (for level estimation), ordinary and extraordinary to be determined by the Faculty

Comentario [U1]: Room 12

Comentario [U2]: 24 jan, 20 jun

In agreement with the rules of evaluation and qualification of the students of the University of Granada, approved may 20th 2013, the evaluation will be continuous with the exception provided for single final evaluation.

**CONTINUOUS EVALUATION**

*Items and weight in the final qualification mark*

- Systematic assistance and involvement to the planned face-to-face sessions (10%). In each session the subjects will be introduced and an active search and discussion of the contents of the web sites will be performed.
- Involvement and active participation in all the follow-up forums (30%). Forums will be open for each subject developed at class). In each forum the student has to describe in terms of competences what he/she has learnt and discuss in the group when requested.
- Individual work (30%): Each student will present to the group and discuss a molecular pathology case.
- Laboratory performance (30%). Individual/Collective work in the laboratory that is compulsory to obtain a final mark.
- Written tests (if necessary, or to increase marks)



---

### **SINGLE FINAL EVALUATION**

According to the Policy Evaluation and Rating of Students of the University of Granada (Approved by the Governing Council at its extraordinary meeting of 20 May 2013), the realization of a single final assessment to which students may benefit contemplated they can not comply with the method of continuous assessment for work, health status, disability or any other duly justified reason to prevent them from continuing the regime of continuous assessment. To qualify for the single final evaluation, the student, in the first two weeks of teaching of the subject, it shall request the Director of the Department, who will transfer to the faculty corresponding alleging and proving the reasons that assist you to be unable to follow the system continuous assessment. Ten days after the student has received express reply in writing to the Director of the Department, is deemed to have been dismissed. In case of refusal, the student may file, within one month appeal before the Rector, who may delegate to the Dean or Director of the Centre, exhausting administrative remedies.

Students who have chosen this system and had been admitted to it during the first two weeks of teaching, will have to perform two tests: theoretical examination of all matter which consist of two parts: one with test questions and other questions of development. The exam will be the arithmetic mean of the ratings of the two sides if they had passed both independently, with a minimum of 5 points out of 10. Practical examination in the laboratory. This test may be waived if the student had made practices and have overcome. The weight of both exams in the course grade will be 70% for theory and 30% practice.

Teachers may make additional oral examinations whenever necessary to better weigh the score or any doubt about the authenticity of written exercises.

**EXTRAORDINARY EXAMS** will include all the matters of the course or specific parts.

**EXAMS WITH TRIBUNAL.** Students who have applied examined in a court shall make an equivalent to that described for the single final evaluation written exam. The test will be evaluated by a panel of three professors of the Department.



---

<b>ADDITIONAL INFORMATION</b>
Information on the subject can be found on the website of the Department of Biochemistry and Molecular Biology 2: <a href="http://farmacia.ugr.es/BBM2/">http://farmacia.ugr.es/BBM2/</a>



*ugr* | Universidad  
de Granada

INFORMACIÓN SOBRE TITULACIONES DE LA UGR  
<http://grados.ugr.es>