

课程大纲

COURSE SYLLABUS

1.	课程名称 Course Title	表观遗传学/Epigenetics
2.	课程类别 Course Type	选修/Elective Courses
3.	授课院系 Originating Department	生物系/Department of Biology
4.	可选课学生所属院系 Open to Which Majors	生物系/Biology
5.	课程学时 Credit Hours	48
6.	课程学分 Credit Value	3
7.	授课语言 Teaching Language	英文/English
8.	授课教师 Instructor(s)	侯春晖/Chunhui Hou
9.	先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	遗传学, 生物化学/Genetics, Biochemistry
10.	教学目标 Course Objectives	
	<p>表观遗传学 (epigenetics) 研究非基因序列改变的因素所导致的基因表达变化, 如 DNA 甲基化、组蛋白修饰和染色质构象变化等。本课程面向研究生和本科高年级同学系统地讲述表观遗传学的概念、问题、研究方法, 以及技术和应用等方面的实践探索。</p> <p>Epigenetics is the study of the regulation of gene expression mediated by modifications in the chromatin rather than the alteration in DNA sequence. For example, DNA methylation, histone modifications, and chromatin remodeling are frequently involved in the regulation of gene expression. The objectives of this course for the students are to master the fundamental concepts in epigenetics, to understand how epigenetic modifications are established, recognized and erased, and also to develop research interest in this field.</p>	
11.	教学方法及授课创新点 Teaching Methods and Innovations	

本课程主要以英文讲授，采用课堂讲授基本理论概念，学生分组讨论前沿进展和问题这两种形式，全面培养学生对表观遗传学在基础概念、研究方法、前沿问题各方面的认识。

Teaching in both Chinese and English. Basic concepts, theories and facts are delivered through teaching. Students work in groups to discuss the latest progress in the field of epigenetics research.

12. 教学内容及学时分配 Course Contents and Course Schedule

1. 历史和总介/History and Overview/3 hours
2. 组蛋白修饰/Histone Modifications (Writers, Readers and Erasers)/3 hours
3. 组蛋白变体/Histone Variants/3 hours
4. DNA 甲基化/DNA Methylation/3 hours
5. 转录沉默机制/Transcriptional Silencing/3 hours
6. 基因组印记/Genomic Imprinting/3 hours
7. 剂量补偿/Dosage Compensation/3 hours
8. 核小体重塑/Nucleosome Remodeling/3 hours
9. 长程染色质相互作用/Long-Range Chromatin Interactions/3 hours
10. RNA 和染色质状态/RNA and Chromatin State/3 hours
11. 植物中的表观调控/Epigenetic Regulation in Plant/3 hours
12. 模式生物中的表观遗传/Epigenetics in Model Systems/3 hours
13. 表观遗传和细胞诱导多能性/Epigenetics and Induced Pluripotency/3 hours
14. 表观遗传和免疫/Epigenetics and Immunity/3 hours
15. 表观遗传和人类疾病/Epigenetics and Human Disease/3 hours

13. 课程考核 Course Assessment

文献报告/Literature Research and Presentation/10%

期中考试/Midterm Examination/30%

小测验/Quiz/20%

期末考试/Final Examination/40%

14. 教材及其它参考资料 Textbook and Supplementary Readings

教材主要参考“Epigenetics, second edition”，由 C. David Allis 等人主编，同时选择最新相关各领域的重要研究论文为教学讨论材料。

Epigenetics, 2nd edition. Latest research articles et al.