南方科技大学 SOUTHERN UNIVERSITY OF SCIENCE AND TECHNOLOGY

课程详述

COURSE SPECIFICATION

以下课程信息可能根据实际授课需要或在课程检讨之后产生变动。如对课程有任何疑问，请联系授课教师。

The course information as follows may be subject to change, either during the session because of unforeseen circumstances, or following review of the course at the end of the session. Queries about the course should be directed to the course instructor.

1.	课程名称 Course Title	高级细胞生物学 Advanced Cell Biology
2.	授课院系 Originating Department	生物系 Department of Biology
3.	课程编号 Course Code	BIO323
4.	课程学分 Credit Value	2
5.	课程类别 Course Type	专业选修课(生物科学、生物技术、生物信息学） Major Elective Courses (Biological Sciences, Biotechnology, Bioinformatics)
6.	授课学期 Semester	春季 Spring
7.	授课语言 Teaching Language	英文 English
8.	授课教师、所属学系、联系方式（如属团队授课，请列明其他授课教师） Instructor(s), Affiliation& Contact （For team teaching, please list all instructors）	张严冬，助理教授，生物系 第 1 科研楼 335 室 zhangyd@sustc.edu.cn 0755-8801-8422 ZHANG, Yandong , Assistant Professor, Department of Biology Rm.335, No.1 Research Bldg.
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	待公布 To be announced
10.	选课人数限额(可不填) Maximum Enrolment （Optional）	20

11. 授课方式 Delivery Method	讲授 Lectures	习题/辅导/讨论 Tutorials	实验/实习 Lab/Practical	其它(请具体注明) Other（Please specify）	总学时 Total
学时数 Credit Hours	32	0	0	0	32

12.	**先修课程、其它学习要求 Pre-requisites or Other Academic Requirements**	BIO206-15 细胞生物学 Cell Biology
13.	**后续课程、其它学习规划 Courses for which this course is a pre-requisite**	本课程为生物系专业选修课，对有兴趣了解并扩展细胞生物专业领域的学生比较适合。 This course should be taken by students who intend to expand their knowledge and understanding about cell biology
14.	**其它要求修读本课程的学系 Cross-listing Dept.**	无 None

教学大纲及教学日历 SYLLABUS

15. **教学目标 Course Objectives**

这门课简介人类细胞在病理条件下的反应和一些致病机理。我们把课程分为几个主要的模块，包括病原微生物对人类宿主细胞的侵袭和细胞的反应，这一过程的失调所导致的人类疾病过程；人免疫系统对外界病原的反应机理；多细胞生物的发育过程中的重要信号转导机制及失调导致的人类疾病；非编码 RNA 及其对基因的调控；细胞的迁移和癌症转移的分子机理；细胞的重编程和诱导多功能干细胞等题目。学生在每个模块学习之后需要参与小组讨论并学习简介一篇相关文献。

This course focuses on cell biology in pathology. We choose topics that are currently in the frontiers in cell biology and their deregulation is linked to human diseases. The topics include bacterial and virus pathogenesis, immune response; cellular signaling during development as well as its dysregulation in cancer; Non-coding RNA and gene regulation; cell migration and cancer metastasis; cell programming and pluripotent stem cells. Students are required to participate in group discussion and should give one research article presentation based on his interest.

16. **预达学习成果 Learning Outcomes**

学生对细胞在病理条件下的异常反应会有更深入的了解， 同时涉及的课题将是最前沿的研究领域。 Students are expected to have a deeper understanding about patholody, the topics covered in the lectures will be cutting-edge research.

17. **课程内容及教学日历 （如授课语言以英文为主，则课程内容介绍可以用英文；如团队教学或模块教学，教学日历须注明主讲人）**
Course Contents (in Parts/Chapters/Sections/Weeks. Please notify name of instructor for course section(s), if this is a team teaching or module course.)

Week No.	讲座题目 Lecture Topic	学时 hours	讲座具体内容 Lecture Contents
Week 1	模块 1：病原侵染的细胞生物学 Module I: Cell Biology of infection	2 学时 2 hours	病原微生物的种类 病原微生物的典型生活周期 病原进入宿主的途径机理 病原微生物的致病机理 Category of pathogens Life cycles of pathogens Entry routes of pathogens Virulence factors and mechanisms
Week 2	模块 1： 免疫应答和信号通路 Module I: Immune response and	2 学时 2 hours	爱德华医生和天花疫苗 人类细胞的防御系统

	the signaling pathway		病原微生物和先天免疫 病毒和干扰素 后天免疫系统简介 Edward Jenner and small pox Defence systems in human being Pathogens and innate immunity Virus and interferons Adaptive immune system
Week 3	模块 1： 免疫和癌症治疗 Module I: Immunology and Cancer prevention	2 学时 2 hours	B 细胞系统应答 T 细胞系统应答 抗体的多样化机理 免疫治疗 cell response T cell response Diversification of antibodies immunotherapy
Week 4	小组讨论和学生报告 Group discussion and presentation	2 学时 2 hours	
Week 5	模块 2： 发育和信号转导通路 Module II: 1. Development and signaling pathways	2 学时 2 hours	人体发育和出生缺陷 发育的基本步骤 发育中的关键基因的发现 Human development and birth defects Key steps in development Critical genes in development
Week 6	模块 2：发育和信号通路 Module II: 2. Development and signaling pathways	2 学时 2 hours	Notch 信号通路 Wnt 信号通路 Hedgehog 信号通路 Hippo 信号通路

			Notch signaling Wnt signaling Hedgehog signaling Hippo signaling
Week 7	模块 2： 发育失调和人类疾病 Module II: Development and its dysregulation	2 学时 2 hours	Par 基因和细胞的不对称分裂 果蝇中的花样形成机理 发育中的细胞迁移 和原肠胚 Par gene and asymmetric division In C. elegans development Pattern formation in drosophila And its underlying mechanisms Gastrulation and molecular control
Week 8	小组讨论和学生报告 Group discussion and presentation	2 学时 2 hours	
Week 9	模块 3：细胞迁移和癌症转移 Module III: Cell migration and cancer metastasis	2 学时 2 hours	癌症转移的“种子土壤”理论的提出 肿瘤迁移的具体步骤 EMT 理论的提出 肿瘤迁移中的重要调控因子和其失调 The “ seed and soil” theory Detailed steps in metastasis EMT theory Cricital factors in metastasis
Week 10	小组讨论和学生报告 Group discussion and presentation	2 学时 2 hours	
Week 11	期中考试 Midterm exam	2 学时 2 hours	

Week 12	模块 4：非编码 RNA 及其对基因的调控 Module IV. Non-coding RNA control of gene expression,	2 学时 2 hours	siRNA and micro RNA linc RNA circular RNA piRNA, etc
Week 13	小组讨论和学生报告 Group discussion and presentation	2 学时 2 hours	
Week 14	模块 5： 细胞重编程和诱导多功能干细胞 Module V. Cell reprogramming Pluripotent stem cells	2 学时 2 hours	Yamanaka 因子 诱导多功能干细胞的方法 分化细胞之间的转化 多功能干细胞的应用 Yamanaka factors Induced iPS Conversion of differentiated cells Applications of iPS
Week 15	小组讨论和学生报告 Group discussion and presentation	2 学时 2 hours	
Week 16	复习 Review session	2 学时 2 hours	
Final weeks	Final Exam		

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

无 none

课程评估 ASSESSMENT

19. 评估形式 Type of Assessment	评估时间 Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes

出勤 Attendance				
课堂表现 Class Performance				
小测验 Quiz				
课程项目 Projects		40		
平时作业 Assignments				
期中考试 Mid-Term Test		30		
期末考试 Final Exam		30		
期末报告 Final Presentation				
其它（可根据需要改写以上评估方式） Others (The above may be modified as necessary)				

20. 记分方式 **GRADING SYSTEM**

☑ A. 十三级等级制 **Letter Grading**
☐ B. 二级记分制（通过/不通过） **Pass/Fail Grading**

课程审批 REVIEW AND APPROVAL

21. **本课程设置已经过以下责任人/委员会审议通过**
This Course has been approved by the following person or committee of authority

本课程经生物系本科教学指导委员会审议通过。
This Course has been approved by Undergraduate Teaching Steering Committee of Department of Biology.