

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	医学细胞生物学 Medical Cell Biology				
2.	授课院系 Originating Department	医学院 School of Medicine				
3.	课程编号 Course Code	MED205				
4.	课程学分 Credit Value	3				
5.	课程类别 Course Type	专业基础课/ Major Foundational Courses				
6.	授课学期 Semester	春季/ Spring				
7.	授课语言 Teaching Language	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)	卢奕, 医学院, luy3@sustech.edu.cn Lu Yi, School of Medicine, luy3@sustech.edu.cn				
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	无 /NA				
10.	选课人数限额(可不填) Maximum Enrolment (Optional)					
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	48	N/A	N/A	N/A	48
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12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	无/NA
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite	待定/To be determined
14. 其它要求修读本课程的学系 Cross-listing Dept.	待定/To be determined

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

医学细胞生物学是基础医学和临床医学的基础课程。通过本课程的学习，学生应理解与掌握：1. 细胞中重要大分子及其复合物的构成与功能；2. 细胞中各种亚细胞器的结构和功能；3. 细胞中各项有序的生命活动的基本原理，如物质运输、细胞周期、细胞通讯、细胞分化、细胞死亡等；4. 细胞组分、亚细胞器与细胞功能异常与疾病的关系；5. 干细胞及组织再生等细胞生物学前沿领域的研究与应用。本课程通过与医学、病理学知识的融合，使学生对细胞生物学的理解更加深刻，激发扩展思维、提高综合能力。

Medical cell biology is one of the fundamental courses in basic medicine and clinical medicine. By learning this course, the students should be able to understand: 1. the composition and functions of major biomolecules and their complexes in the cell; 2. the structure and functions of the intracellular organelles; 3. the concepts and principles of cellular activities such as molecular transport, cell-cell communication, cell cycle, cell differentiation and cell death; 4. the impact of abnormal cellular components/organelles or cellular dysfunction on disease development; 5. some concepts of stem cell and tissue regeneration. By integrating with medicine and pathology, this course provides in-depth understanding on cell biology, inspires extended thinking, and improves the students' comprehensive capability.

16. 预达学习成果 Learning Outcomes

本课程完成后，学生应对细胞有系统的了解，包括：细胞的组成，亚细胞器的结构和功能，膜生物化学及物质运输，细胞微环境与细胞间作用，细胞活动如细胞周期、细胞分化、细胞衰老与死亡等，以及细胞功能异常与疾病的关系。

By completing this course, the students will have a systematic understanding of cell, covering the following aspects: cellular composition, structure and function of subcellular organelles, membrane biochemistry and transport, cellular activities such as cell cycle, cell differentiation, cell senescence and cell death. The students will also have some concepts on the relationship between cellular dysfunction and human diseases.

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.)

第一章 绪论

Chapter 1. Introduction

1. 细胞生物学概述 Introduction to cell biology
2. 细胞生物学发展的几个主要阶段 Milestones during the evolution of cell biology
3. 细胞生物学与医学 Cell biology and medical science

第二章 细胞的概念与分子基础

Chapter 2. The concept and molecular basis of cell

1. 细胞的基本概念 Basic concept of cell
2. 细胞的起源与进化 Origin and evolution of cell
3. 细胞的分子基础 Molecular basis of cell

第三章 细胞生物学的研究方法

Chapter 3. Approaches for cell biology research

1. 显微镜技术 Microscopic technology
2. 细胞的分离和培养 Isolation and culture of cells
3. 细胞组分的分离和纯化技术 Fractionation and purification of cellular components
4. 细胞化学与细胞内分子示踪技术 Chemical labeling and tracking of intracellular molecules
5. 细胞功能基因组学研究技术 Functional genomics studies in cells

第四章 细胞膜与物质的穿膜运输

Chapter 4. Cell membrane and trans-membrane transport of materials

1. 细胞膜的化学组成与生物学特性 Chemical composition and biological characteristics of the cell membrane
2. 小分子物质和离子的穿膜运输 Trans-membrane transport of small molecules and ions
3. 大分子和颗粒物质的穿膜运输 Trans-membrane transport of large molecules and particles
4. 细胞表面特化结构 Specialized structures on cell surface
5. 细胞膜异常与疾病 Dysfunction of cell membrane and related diseases

第五章 细胞的内膜系统与囊泡转运

Chapter 5. Cell membrane system and vesicle transport

1. 内质网 The endoplasmic reticulum (ER)
2. 高尔基复合体 Golgi complex
3. 溶酶体 Lysosome
4. 过氧化物酶体 Peroxisome
5. 囊泡与囊泡转运 Vesicle and vesicle-mediated transport
6. 细胞内膜系统与医学的关系 The cell membrane system in medical sciences

第六章 线粒体与细胞的能量转换

Chapter 6. Mitochondrion and Energy Conversion

1. 线粒体的基本特征 Basic characteristics of the mitochondrion

2. 细胞呼吸与能量转换 Cellular respiration and energy conversion
3. 线粒体与疾病 Mitochondrion and related diseases

第七章 细胞骨架与细胞的运动

Chapter 7. Cytoskeleton and cell motility

1. 微管 Microtubule
2. 微丝 Microfilament
3. 中间纤维 Intermediate filament
4. 细胞骨架与细胞运动 Cytoskeleton and cell motility
5. 细胞骨架与疾病 Cytoskeleton and diseases

第八章 细胞核

Chapter 8. Nucleus

1. 核膜 Nuclear membrane
2. 染色质与染色体 Chromatin and chromosome
3. 核仁 Nucleolus
4. 核基质 Nuclear matrix
5. 细胞核的功能 The function of nucleus
6. 细胞核与疾病 Nucleus and related diseases

第九章 细胞连接与细胞粘附

Chapter 9. Cell junction and cell adhesion

1. 细胞连接 Cell Junction
2. 细胞粘附 Cell Adhesion

第十章 细胞微环境及其与细胞的相互作用

Chapter 10. Extracellular micro-environment and cell-cell interaction

1. 细胞微环境的组成 The composition of extracellular micro-environment
2. 细胞外基质的主要组成成分 Main components of extracellular matrix
3. 细胞微环境与细胞间的相互作用 Extracellular micro-environment and cell-cell interaction
4. 细胞微环境异常与疾病 Abnormal extracellular micro-environment and related diseases

第十一章 细胞分裂与细胞周期

Chapter 11. Cell division and cell cycle

1. 细胞分裂 Cell division
2. 细胞周期及其调控 Cell cycle and its regulatory mechanism
3. 细胞周期与医学 Cell cycle and medicine

第十二章 生殖细胞与受精

Chapter 12. Germ cells and fertilization

1. 生殖细胞的起源与发生 The origin and development of germ cells
2. 受精与医学 Fertilization and medicine

第十三章 细胞分化

Chapter 13. Cell differentiation

1. 细胞分化的基本概念 Basic concepts of cell differentiation
2. 细胞分化的分子基础 The molecular basis of cell differentiation
3. 细胞分化的影响因素 The influencing factors of cell differentiation
4. 细胞分化与医学 Cell differentiation and medicine

第十四章 细胞衰老与死亡

Chapter 14. Cell senescence and cell death

1. 细胞衰老 Cell Senescence
2. 细胞死亡 Cell Death
3. 细胞自噬 Autophagy

第十五章 干细胞与组织再生

Chapter 15. Stem cells and tissue regeneration

1. 干细胞概述 Introduction to stem cell biology
2. 胚胎干细胞 Embryonic stem cell
3. 组织干细胞 Adult stem cell
4. 干细胞与医学 Stem cells and medicine

Section Contents

Section	Hour	Teaching Contents
1	3	第一章 绪论 Chapter 1. Introduction
2	3	第二章 细胞的概念与分子基础 Chapter 2. The concept and molecular basis of cell
3	3	第三章 细胞生物学的研究方法 Chapter 3. Approaches for cell biology research
4	3	第四章 细胞膜与物质的穿膜运输 Chapter 4. Cell membrane and trans-membrane transport of materials
5	3	第五章 细胞的内膜系统与囊泡转运 Chapter 5. Cell membrane system and vesicle transport
6	3	第六章 线粒体与细胞的能量转换 Chapter 6. Mitochondrion and Energy Conversion
7	3	第七章 细胞骨架与细胞的运动 Chapter 7. Cytoskeleton and cell motility

8	3	第八章 细胞核 Chapter 8. Nucleus
9	3	第九章 细胞连接与细胞粘附 Chapter 9. Cell junction and cell adhesion
10	3	第十章 细胞微环境及其与细胞的相互作用 Chapter 10. Extracellular micro-environment and cell-cell interaction
11	3	第十一章 细胞分裂与细胞周期 Chapter 11. Cell division and cell cycle
12	3	第十二章 生殖细胞与受精 Chapter 12. Germ cells and fertilization
13	3	第十三章 细胞分化 Chapter 13. Cell differentiation
14	3	第十四章 细胞衰老与死亡 Chapter 14. Cell senescence and cell death
15	3	第十五章 干细胞与组织再生 Chapter 15. Stem cells and tissue regeneration
16	3	复习与讨论 Review & discussion



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

1. 《医学细胞生物学》，陈誉华、陈志南主编，第6版（2018），人民卫生出版社。
2. Molecular Biology of the Cell, 5th edition, Bruce Alberts, et al., Garland Science, Taylor and Francis Group, 2015.

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		10		
课堂表现 Class Performance		10		
小测验 Quiz		30		
课程项目 Projects				
平时作业 Assignments				
期中考试 Mid-Term Test				
期末考试 Final Exam		50		
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

本课程已经医学院教学主任张文勇教授审核通过。