

## 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。

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1. 课程名称 Course Title	免疫与健康 Immunity and Health
2. 授课院系 Originating Department	医学院 School of Medicine
3. 课程编号 Course Code	MED106
4. 课程学分 Credit Value	2
5. 课程类别 Course Type	专业导论类/ Introduction to Majors
6. 授课学期 Semester	春/秋季 Spring/Fall
7. 授课语言 Teaching Language	中英双语 English & Chinese
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)	任欢, 医学院, <a href="mailto:renh@sustech.edu.cn">renh@sustech.edu.cn</a> Huan Ren, School of Medicine, renh@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	32				32
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	无/NA				
14. 其它要求修读本课程的学系 Cross-listing Dept.	无/NA				

### 教学大纲及教学日历 SYLLABUS

#### 15. 教学目标 Course Objectives

本课程以普及免疫学基础与前沿进展相关知识涵盖为目标。通过介绍免疫系统的组成及功能作用、免疫与健康各方面的相互关联以及免疫与疾病发生和预防的相关知识和历史进展，免疫治疗药物市场与全球行业分析等。为理工科及生物医学专业学生提供基础免疫学和临床免疫学相关的知识储备，启发兴趣，为其进一步深入专业学习以及今后学科交叉、融会贯通式学习与科学研究提供必要的前期基础与指导。

This course aims to popularize the basic and frontier knowledge of immunology. By introducing the composition and function of the immune system, the correlation between immunity and health, as well as the related knowledge of immunity and disease mechanisms and prevention, this course aims to provide the students of varied disciplines majored in Science, Engineering and Bio-medicine etc. with the knowledge of basic immunology and clinical immunology, inspire their interest, and provide the necessary information for further professional study, interdisciplinary study and research in the future.

#### 16. 预达学习成果 Learning Outcomes

本课程完成后，学生将能够：

- (1) 掌握免疫学相关基础知识，免疫系统的功能作用
- (2) 熟悉免疫系统在健康与环境中的作用；
- (3) 以病例分析等形式了解免疫系统在疾病的作用以及免疫学技术与应用
- (4) 培养独立思考的能力和严谨求实的科学作风。

The students will

- (1) Master the basic knowledge of immunology and the function of immune system
- (2) Be familiar with the role of immune system in health and environment;
- (3) To understand the role of the immune system in diseases in the form of case analysis, as well as immunological technology and application;
- (4) Be trained on independent thinking, preciseness and factualism.

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.)**

导言：身体每次所遭受的攻击和防御反应，其中基本问题包括：身体如何决定自我、非我？几千年的进化过程中，身体如何知道什么对你有好处，什么会害死你？身体会经历过敏反应、排异反应、自身免疫应答、抗感染&抗肿瘤免疫应答、免疫逃逸和损伤…在生物进化的背景下，本课程将试图理解在维护身体健康与环境斗争中，免疫系统生成的智慧与差错失误，这些将引导我们认识未来医学发展方向。

Introduction: Every time the body is attacked and defensive, the basic questions include: how does the body decide the ego and non-ego? In thousands of years of evolution, how does the body know what's good for you and what's going to kill you? The body will experience allergic reaction, rejection, autoimmune response, anti-infection & anti-tumor immune response, immune escape and injury In the context of biological evolution, this course will try to understand the wisdom and mistakes generated by the immune system in the struggle between maintaining health and the environment, which will guide us to understand the future direction of medical development.

Part 1: Overview of immune system

1. What your immune system does
2. Innate and adaptive immune responses
3. Cells, organs and molecules of immune system
4. Immunity and homeostasis

Part 2: Evolution of the immune system

1. Immune capacity among invertebrates
2. Immune capacity among vertebrates
3. Genetic origins of the immune system
4. Environmental pathogens and human evolution

Part 3: Flu, cold, inflammation and infection

1. Biggest flu epidemics in history
2. Flu symptoms and anti-viral immunity
3. Cold, stress and your health
4. Anti-bacterial immunity and immunopathology
5. Human microbiome: what microbes do in our body?

Part 4: Cancer is a non-solved inflammation.

1. How cancer develop and escape immunity
2. Anti-tumor immunity
3. Immune components that aid tumour progression

4. Cancer Immunotherapy

Part 5: What's the benefit of having allergies

1. Types of hypersensitivity
2. Common allergens
3. Basis of hypersensitivity
4. Treatment of hypersensitivity

Part 6: Why your immune system attacking yourself

1. Discerning autoimmunity from hypersensitivity
2. How immune tolerance is broken
3. Basis of autoimmune diseases
4. Treatment of autoimmunity

Part 7: Vaccination and Herd Immunity

1. History of vaccination
2. Herd immunity, where are we now
3. Different types of vaccines and immunization schedule
4. Immune responses following vaccination

Part 8: Transplantation Immunology

1. Basis of transplantation rejection
2. Consideration before transplantation
3. Hematopoietic transplantation
4. Tissue transplantation

Part 9: Immunological Techniques and applications

1. Immunodiagnostic techniques
2. Immunotherapeutics
3. Future medicine; Immunotherapy drugs market: global industry analysis 2025

Quiz, Review & discussions, Presentations interspersed throughout the semester

Section	Topic	Hours
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1	免疫系统概述, 免疫系统组成和免疫应答 Overview of immune system, composition of immune system and immune response	2
2	免疫与内环境稳定; 免疫与健康 Immunity and homeostasis; maintenance of immunity	2
3	免疫系统的进化、免疫系统基因组学 Evolution of the immune system; genetic origins of immune system	2
4	抗细菌免疫与正常菌群; 炎症、感染与免疫病理 Anti-infective immunity and mechanism, normal flora; inflammation, infection and immunopathology	2
5	病毒感染与人类进化; 历史上流感大爆发案例、抗病毒免疫 Virus infection and human evolution; Influenza outbreaks in history, antiviral immunity	2
6	感冒与流感; 免疫力与疾病转归; 人体微生物组学 Cold and flu; immunity and cure of the disease; Human microbiomics	2
7	肿瘤生长与免疫逃逸、抗肿瘤免疫应答 Tumor growth, immune escape and anti-tumor immune response	2
8	肿瘤生物治疗与免疫治疗现状与发展 Current situation and development of tumor biotherapy and immunotherapy	2
9	超敏反应的类型与机制 Types and mechanisms of hypersensitivity	2
10	过敏性疾病的治疗及预防 Prevention and Treatment of allergic diseases	2
11	自身免疫病与自身免疫 Autoimmune diseases and autoimmunity	2
12	自身免疫病例分析, 自身免疫病的自愈机制 Analysis of autoimmune cases, self-healing of autoimmune diseases	2
13	疫苗与群体免疫; 疫苗技术与发展 Vaccine and population immunity; vaccine technology and development	2
14	疫苗的选择、副作用与接种计划 Vaccine selection, side effects and vaccination plan	2
15	移植免疫、移植排斥反应、免疫耐受等相关问题 Transplantation immunity, transplantation rejection, immune tolerance and so on	2
16	免疫学技术治疗; 未来医学发展方向; 免疫治疗药物市场-全球行业分析 Immuno-diagnosis vs therapy; future medicine; immunotherapy drugs market-global analysis	2

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

Reference books:

1. Richard Coico, Geoffrey Sunshine, Immunology A short course; Wiley Blackwell, 7th ed., 2015
2. Daniel M Davis, The Beautiful Cure The revolution in immunology and what it means for your health. The university of Chicago press, 2018
3. Kenneth Murphy and Casey Weaver. Janeway's Immunobiology. W. W. Norton & Company; 9th ed., 2016

### 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		5		
课堂表现 Class Performance				
小测验 Quiz		15		
课程项目 Projects				
平时作业 Assignments		10		
期中考试 Mid-Term Test		20		
期末考试 Final Exam				
期末报告 Final Presentation		40		
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