

UCT PTY6001W

Convener: Jeffrey Dorfman
Coordinator: Frank Kirstein

Mon Thurs 09h30-11h00

Venue: to be announced

Textbook: Janeway's Immunobiology, 7th edition

Available in South Africa:

<http://www.kalahari.net/books/Janeways-Immunobiology-With-CDROM/632/31495504.aspx>

This textbook will be used as a reference and for organisation of the course topics. The main point of this course is to give students the tools required to read and evaluate scientific papers in the field, including but not limited to the basic information in the textbook. Earlier editions are useful; but, the chapter numbers do not always match.

End of theme sessions (Themes 1-4):

- (1) **15 minute MCQ quiz covering both the theme and the assigned journal club paper**
- (2) **30 minute test. Students will be required to answer 2-3 questions about a paper related to the theme. This paper will be provided to the students 3-4 days prior and an unmarked copy of the paper may be used during the test.**
- (3) **40 minute journal club and discussion of the test paper**
- (4) **For each theme, there is a separate lecturer-led journal club.**

Each lecturer is requested to submit 5 MCQ's about their lecture when they give it. Please submit to Dhurayah Abdelatif, copied to Frank Kirstein.

Student project presentations (end of course):

Each student presents a research proposal (and results if available) from their own current or upcoming research project.

Student journal clubs (end of course):

Each student presents an assigned research report in a 25 minute session, plus discussion.

Basic block

Mon 15 Feb Lecture 1: Abbas Chapter 1, Janeway Chapter 1

Reto Guler

Introduction

Basic Principles. What is memory and why is the immune system important? Basics of antibody structure and recognition by B and T cells. Receptor diversity and VDJ recombination.

Thu 18 Feb Lecture 2: Janeway Chapter 2

Muazzam Jacobs

Innate Immunity. Toll-like receptors and pattern recognition. Interface between adaptive and innate immunity

Mon 22 Feb Lecture 3: Janeway Chapter 3, 4

Frank Kirstein

Recognition by B and T cell receptors. Antibody and TCR structure. Introduce CD4, CD8, MHC presentation.

Thu 25 Feb Lecture 4: Janeway Chapter 5

Jeff Dorfman

Antigen Presentation by MHC

Mon 29 Feb Lecture 5: Janeway Chap 7 pt 1, research reports

Bill Horsnell

B cell development. Antibodies and BCRs

Thu 03 Mar Lecture 6: Janeway Chapter 7 pt 2 and Chap 14 end

Jeff Dorfman

Introduction to mice and immunology

Mon 07 Mar no class, SAIS meeting

Thu 10 Mar Lecture 7: Janeway Chapter 7 pt 2 and Chap 14 end
T cell development

Sara Suliman

Mon 14 March Lecture 8: Janeway Chapter 9
B cell activation and antibody production. Complement. Immunoglobulin isotypes. Fc receptors

Adam Penn-Nicholson

Thu 17 Mar Discussion

Clive Gray

Lymphoid and mucosal immunity: how immune responses are anatomically organized.

Mon 21 Mar no class, Human Rights Day

Thu 24 March

Jeff Dorfman

Journal Club: Madsen L, Labrecque N, Engberg J, Dierich A, Svejgaard A, Benoist C, *et al.* Mice lacking all conventional MHC class II genes. *Proc Natl Acad Sci U S A* 1999,**96**:10338-10343.

Mon 28 Mar no class, Easter Monday

Thu 31 March Midterm examination

Theme 1: Antigen specificity and tools to understand immunology

Mon 04 April Lecture 9:
Mice and immunology: part II

Sara Suliman

Thu 07 April Lecture 10:
How to measure antigen-specific and innate immune responses

Elisa Nemes

Mon 11 April Discussion session
How to measure antigen-specific and innate immune responses

Elisa Nemes

Thu 14 April Lecture 11:
Antigen specific Responses and vaccines: immune protection from pathogens

Clive Gray

Mon 18 April Lecturer-led journal club
Journal Club: Pobezinsky LA, Angelov GS, Tai X, Jeurling S, Van Laethem F, Feigenbaum L, *et al.* Clonal deletion and the fate of autoreactive thymocytes that survive negative selection. *Nat Immunol* 2012,**13**:569-578.

Sara Suliman

Thu 21 April no class

Mon 25 Apr Test/Journal club paper
Kaye J, Hsu ML, Sauron ME, Jameson SC, Gascoigne NR, Hedrick SM. Selective development of CD4+ T cells in transgenic mice expressing a class II MHC-restricted antigen receptor. *Nature* 1989,**341**:746-749.

Sara Suliman, Jeff Dorfman

Theme 2: Immune responses and memory

Thu 28 Apr Lecture 12: Janeway Chapter 8, other material
T cell Immunity, including Th1/Th2 responses

Elisa Nemes

Mon 02 May: no class, May Day

Mon 05 May Lecture 13: Janeway Chapter 10, other material (part I)
Dynamics of immune cell types. CD4 help of CD8 T cells, B/T interactions, presentation by memory B cells

Jeff Dorfman

Mon 09 May Lecture 14:
Immunological memory of T cells in humans

Clive Gray

Thu 12 May Lecture 15: Janeway Chapter 10, other material (part I)
Dynamics of immune cell types. CD4 help of CD8 T cells, B/T interactions, presentation by memory B cells

Jeff Dorfman

Mon 16 May Lecture 16:
NK cell recognition. Bone marrow graft rejection. Natural cytotoxicity. Missing self and RMA/s

Jeff Dorfman

Thu 19 May Lecturer-led journal club
JC: Murali-Krishna K, Lau LL, Sambhara S, Lemonnier F, Altman J, Ahmed R. Persistence of memory CD8 T cells in MHC class I-deficient mice. *Science* 1999;**286**:1377-1381.

Jeff Dorfman

Mon-Thur 23-26 May no class, Keystone vaccines meeting, Cape Town

Mon 30 May Test/Journal club paper:
Sallusto F, Lenig D, Förster R, Lipp M, Lanzavecchia A: Two subsets of memory T lymphocytes with distinct homing potentials and effector functions. *Nature*. 1999. **401**: 708-712.

Frank Kirstein

Theme 3: Tolerance and autoimmunity

Thu 02 June Lecture 17
Immunological tolerance, immune organ privilege and immune regulation.

Clive Gray

Mon 06 June Lecture 18: Infant immunity, the microbiome, and tolerance

Katie Leonard

Thu 09 June Lecture 19: Janeway Chapter 14 end & additional material
Advanced topics in T cell development & bone marrow chimaeras
Graft rejection. Mixed lymphocyte reactions & using them to derive basic principles of immunology

Jeff Dorfman

Thu 09 June: Deadline to hand in summary of research project for presentation

Mon 13 June Lecture 20:
Allergy and hypersensitivity, Asthma and mouse models of asthma

Frank Kirstein

Wed 15 June Lecturer-led journal club **special lecture date**
Hartley SB, Crosbie J, Brink R, Kantor AB, Basten A, Goodnow CC. 1991. Elimination from peripheral lymphoid tissues of self-reactive B lymphocytes recognizing membrane-bound antigens. *Nature* **353**:765-769.

Jeff Dorfman

Thu 16 June no class, Youth Day

Mon 20 June Special lecture time 09:00-11:00

Lecture 22: additional material autoimmunity: **Jonny Peter**
Pathological consequences of the immune response: clinical aspects: IRIS: **Graeme Meintjies**

Thu 23 June Lecture 23: Paradigms of Immunology. Is self/non-self the best/only paradigm?
Part I: "Discontinuity" **Clive Gray**
Part II: "Danger" (Reference: Vance RE: J Imm 165:1725-8 (2000)) **Jeff Dorfman**

Mon 27 June Test/Journal club paper: **Jeff Dorfman**
Nagaraju K et al. Conditional up-regulation of MHC class I in skeletal muscle leads to self-sustaining autoimmune myositis and myositis-specific autoantibodies PNAS 2000 97:9209

Mon 27 June: Deadline to hand in the paper you propose to present for Journal Club

Theme 4: Response to infectious diseases, tissue specific immunity

Thu 30 June Lecture 24: Chapter 12 pt 1 + additional material **Jeff Dorfman**
Evasion and subversion of the immune response. Immune evasion by viruses.

Mon 04 July Lecture 25: **Clive Gray**
HIV and immune dysregulation: pathogenesis and AIDS

Thu 07 July **Claire Hoving**
Lecturer-led journal club: The C-type lectin receptor CLECSF8/CLEC4D is a key component of anti-mycobacterial immunity. Wilson GJ et al Cell Host Microbe. 2015 Feb 11;17(2):252-9. doi: 10.1016/j.chom.2015.01.004

Mon 11 July Lecture 26: **Thomas Scriba**
Immunity to tuberculosis

Thu 14 July Test/Journal club paper: **Reto Guler**
Exam paper: **MicroRNA-223 controls susceptibility to tuberculosis by regulating lung neutrophil recruitment. Doehoi et al JCI 2013 123(11):4836-48**

Mon/Thur 18-21 July no class, Mandela Day and IAS conference, Durban

25, 26 July (note Mon & Tues dates, 08:30-10:00); 1, 4 August (Mon Thurs 09:30-11 as usual)

Student project presentations Graders: Frank Kirstein, Clive Gray

Students to give 15 minute presentation on their own research project, followed by 15 minutes discussion. Students will be expected to present the context of the project in the literature and how the project adds to what is already known. Students will also be required to answer an experimental design question assigned in advance. Two presentations per session. Order of presentations will be chosen by the convener, randomly or partially randomly with more experienced students presenting first.

Tentative schedule based upon 3 presentations/session and 12 students.

08 August no class

11, 15, 18, 22, 25, 29 August

Student Journal clubs Graders: Muazzam Jacobs, TBA

Presentations of assigned scientific journal papers by students.

25 minute presentation for each student, plus 15-20 minutes for discussion. Two presentation per session. Order of presentations will be chosen by the convener, with more experienced students presenting first. Tentative schedule based upon 2 presentations/session and 12 students.

01 Sept Thursday no class

5th September, Monday 09h00-13h00 Tentative date for final exam

Students will be given 5-7 scientific reports about 1 week in advance of the final exam. Approximately 50% of the exam will be questions about these papers. Students may bring copies of the reports for use during the examination. These copies should not have notes written on them.

DRAFT