

## The Immune System in Health and Disease

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**Start date** Saturday 13<sup>th</sup> May 2017      **Time** 10:00am – 16:45pm

**Venue** Madingley Hall  
Madingley  
Cambridge

**Tutor** Dr Tom Monie      **Course code** 1617NDX043

**Director of Programmes** Emma Jennings

**For further information on this course, please contact** Public Programme Coordinator, Clare Kerr  
[clare.kerr@ice.cam.ac.uk](mailto:clare.kerr@ice.cam.ac.uk) or 01223 746237

**To book** See: [www.ice.cam.ac.uk](http://www.ice.cam.ac.uk) or telephone 01223 746262

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### Tutor biography

Tom is the current Academic Director and Teaching Officer for Biological Sciences at the Institute, a Fellow of Christ's College and affiliated to the Department of Veterinary Medicine. As an undergraduate he studied Natural Sciences at the University of Cambridge and specialised in Pathology. His PhD focussed on viral replication and during this time he was awarded the International Retrovirology Young Investigator Award for the UK. After his PhD Tom moved to Imperial College London and studied the structural basis of viral translation initiation. Tom returned to Cambridge in 2006 to focus his research on the innate immune system and began studying the structural basis of pattern recognition receptors such as TLR4 which is important for the immune response to Gram negative bacterial infections and can contribute to the development of septic shock. Between 2008 and 2014 Tom held a prestigious Wellcome Trust Research Development Fellowship to investigate how members of the NLR family of immune receptors are activated, how they drive immune signalling, and how mutation of these receptors contributes to disease. During this time he was part of a team that received international media coverage for their work on cat allergy. Recently he has worked at MRC Human Nutrition Research looking at the connections between immune receptors and intestinal function. Tom is a current Editorial Board Member of the Journal of Biological Chemistry and a lecturer on the undergraduate 1A Biology of Cells course within the University.

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## Course programme

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Please plan to arrive between 9:30 and 10:00. You can meet other course members in the bar. Tea and coffee making facilities are available in the study bedrooms.

09:30	Terrace bar open for pre-course tea/coffee
10:00 – 11:15	<b>Session 1 - The first line of defence - how does the innate immune system work?</b>
11:15	
11:45 – 13:00	Coffee
13:00	<b>Session 2 - Long term protection - antibodies the adaptive immune response?</b>
14:00 – 15:15	Lunch
	<b>Session 3 - Providing protection - the immune system and vaccination.</b>
15:15	Tea
15:30 – 16:45	<b>Session 4 - The role of the immune system in health and disease</b>
16:45	Day-school ends

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## Course syllabus

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### Aims:

This day-course will provide an introduction to the immune system and in particular the first line of defence provided by the “innate” parts of our immune defences. It will introduce the key cells, proteins and molecules that together contribute to provide protection against the continual threat of disease and damage. Using Tutor-provided case studies the students will explore how the immune system works to protect against disease, why it is important for the success of vaccination, and how it can sometimes actually contribute to, or even cause, disease. No prior knowledge of the immune system will be assumed, but a basic familiarity with biological terms and cell biology may be helpful in getting the most from the material covered.

### Content:

The course will begin with a general introduction to the immune system and highlight how it can be broadly split into two components - the innate and the adaptive responses. Session 1 will focus on the first line of defence provided by the innate part of the immune system. It will cover the different types and roles of various immune cells, discuss how the body recognises potential danger, and how it responds to this in a protective manner.

The second session will move the focus to the adaptive immune response, which takes a little longer to respond, but provides us with long-term protection against infection. It will focus in particular upon the protection that is provided by antibodies.

In the afternoon we will look in more detail at some of the practical effects and issues around the immune system. This will begin with a discussion of how the immune system allows vaccines to provide protections against diseases. Using case-studies provided by the Tutor students will explore some of the societal issues that have been, and continue to be, associated with vaccination..

The final session will cover how the immune system can actually contribute to disease. We will cover a range of short term and long term conditions which will include septic shock, allergies, diabetes, inflammatory bowel disease, and autoinflammatory disorders.

### Presentation of the course:

The course will consist of a mixture of Tutor led PowerPoint-illustrated lectures, whole group discussions, and small group discussion and debate.

### As a result of the course, within the constraints of the time available, students should be able to:

- Describe the function of the major components of the immune system.
- Understand how different parts of the immune system work together to protect us against danger and damage.
- Appreciate and summarise how the immune system can both protect from, and lead to, damage and disease.

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## Reading and resources list

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Listed below are a number of texts that might be of interest for future reference, but do not need to be bought (or consulted) for the course.

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Author	Title	Publisher and date
Kenneth Murphy and Casey Weaver	Janeway's Immunobiology (9 <sup>th</sup> Edition)	Garland Science May 2016
Lauren Sompayrac	How the immune system works	Wiley Blackwell Oct 2015
Abul Abbas, Andrew Litchman, Shiv Pillai	Cellular and Molecular Immunology	Elsevier Sept 2014
Tak Mak, Mary Saunders, Brad Jett	Primer to The Immune Response	Academic Cell Sept 2014

### Website addresses

Innate Immunity: The first line of defence

[http://www.garlandscience.com/res/pdf/9780815342434\\_ch02.pdf](http://www.garlandscience.com/res/pdf/9780815342434_ch02.pdf)

**Note** Students of the Institute of Continuing Education are entitled to 20% discount on books published by Cambridge University Press (CUP) which are purchased at the Press bookshop, 1 Trinity Street, Cambridge (Mon-Sat 9am – 5:30pm, Sun 11am – 5pm). A letter or email confirming acceptance on to a current Institute course should be taken as evidence of enrolment.

*Information correct as of:* 05 December 2016