



UNIVERSITÀ DEGLI STUDI DI TORINO

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TIC03\_DIP\_BIOTEC

## Visiting Professor Program Academic year 2020/2021

DEPARTMENT OF MOLECULAR BIOTECHNOLOGY AND HEALTH SCIENCES

TEACHING COMMITMENT: 12 hours

### COURSE TITLE

**Molecular Immunology of the Innate Lymphoid Cells**

### TEACHING PERIOD

2nd term

### SCIENTIFIC AREA

Experimental medical sciences

### LANGUAGE USED TO TEACH

English

The Degree Course is entirely taught in English

### COURSE SUMMARY

Innate Lymphoid cells (ILC) reside in tissues and respond to cytokines and local stimuli but have no antigen receptors. ILCs produce cytokines and factors that influence the tissue micro-environment, including other immune cells. As such, ILCs are key components of immune responses to pathogens, and regulate tissue physiology, including mucosal integrity, interactions with the microbiome, metabolism of adipose tissue, contraction of smooth muscles and expulsion of parasites. According to the transcription factors they depend on and the cytokines they respond to and produce, ILCs belong to either Group 1, 2 or 3. These groups of ILCs functionally resemble Th1, Th2 and Th17 cells. Broadly speaking, Group 1 ILCs are involved in responses to intracellular pathogens, Group 2 ILCs are involved in responses to parasites, and Group 3 ILCs are involved in responses to extracellular pathogens. NK cells belong to Group 1 ILCs and recognise self, its variants – missing, stressed and transformed self – and “the other” (allo-recognition). The course will focus on NK cells: their localization in the body, their receptors, genes, human genetic diversity and cellular education, their function and how these relate to physiology and pathology.

### **LEARNING OBJECTIVES**

Students will acquire an advanced level of knowledge on how ILC perform their functions, the most important molecular pathways used by ILC and the importance of ILC response in medicine, with a particular focus on NK cells.

### **TUTORSHIP ACTIVITIES (IF APPLICABLE)**

### **LAB ACTIVITIES (IF APPLICABLE)**

### **OTHER ACTIVITIES (IF APPLICABLE)**

The Visiting Professor will give also seminars to PhD students and research fellows about NK cell biology. The functions of blood and tissue NK cells differ. Blood NK cells mostly kill and produce inflammatory cytokines. Tissue NK cells are still poorly understood, and they generally do not kill but secrete cytokines that contribute to tissue integrity, barrier function, and vascular changes. The seminars will focus on what is currently known about tissue NK cells.

### **VISITING PROFESSOR PROFILE DESCRIPTION**

The Visiting Professor candidate for this course module should meet the following requirements:

- Strong background in immunology and immune-based technologies, particularly in the field of ILC and NK cells as demonstrated by high-impact scientific publications, participation at international meetings and coordination of research projects;
- At least ten-year work experience in an English-speaking Academic Institution;
- Teaching experience is desirable but not mandatory.

### **CONTACT PERSON AT THE DEPARTMENT**

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