

RECRUITING AND TRAINING PHYSICIANS-SCIENTISTS TO EMPOWER TRANSLATIONAL RESEARCH  
A MULTILEVEL TRANSDISCIPLINARY APPROACH FOCUSED ON METHODOLOGY, ETHICS AND INTEGRITY IN  
BIOMEDICAL RESEARCH - 2018-2023



FONDAZIONE  
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e Clinico Scientifico IRCCS

## RESEARCH TRAINING PROGRAM

### I. General Information

**Title of the research project:**

Natural killer cells in thyroid autoimmune disorders

**Name and address of the department:**

Endocrine Unit, ASST dei Sette Laghi, Varese

**Student's supervisor: Daniela Gallo, Maria Laura Tanda**

### II. Description of the project

1500

**Background**

Thyroid autoimmune disorders (AITD), which include Graves' disease (GD) and Chronic autoimmune thyroiditis (CAT), are common thyroid-specific autoimmune diseases. AITD develop in genetically predisposed subjects following exposure to environmental or endogenous factors. In addition to the prominent involvement of T and B lymphocytes, innate immune cells such as dendritic cells, cytotoxic natural killer (NK) cells and macrophages infiltrating the thyroid gland shape the immune response through their involvement in antigen presentation, modulation of the cytokine milieu, and the release of chemokines.

**What is the aim of the project?**

This observational study aims to elucidate the complex involvement of innate immune cells, particularly NK cells in AITD initiation, progression, and remission by enrolling patients at different stages of the disease. Additionally, human ribonuclease T2 (RNASET2) will be assessed, as a possible regulator of the immune response.

**What techniques and methods are used?**

Immunophenotyping for circulating NK cells by multicolour flow cytometry to assess NK percentage, phenotype, cytokines secretion and degranulation after the exposure to a target.

**When did the department start working on this project?**

2017

Type of research project:

Basic science     Clinical research without lab work     Clinical research with lab work

### III. Student's involvement

The student will mainly observe  YES  NO  
The student will observe the experiments but will be involved in data analysis  YES  NO  
The student will take active part in experiments ("lab work")  YES  NO  
The student will take active part in clinical examination (clinical research)  YES  NO  
The student will be allowed to work with patients  YES  NO

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***What are the tasks expected to be accomplished by the student?***

*The student will learn basic laboratory techniques for the isolation and functional assessment of human immune cells. The student will be involved in patient enrollment, performing experiments, data analysis and interpretation, and will collaborate in collecting and recording data of study.*

***What is expected from/what will be the general outcome of the student?***

*To prepare a poster/presentation/scientific report/abstract*

The student's name will be mentioned in a future publication

Opportunity to present together with the supervisor the results on a conference

No specific outcome is expected

**IV. Requirements**

***What skills are required from the student?***

*Ability to work in team, collaboration and communication skills, knowledge of Scientific English*

***Is there any special knowledge or a certain level of studies needed?***

*Subjects passed: Medical Pathology, Immunology, Physiology, Pharmacology, General Pathology.*

*Previous experience with: Flow cytometry, Patients with endocrine disorders.*

Certificate of:

None

*Are there any legal limitations in the student's involvement in the project?*

YES  NO

*If yes, what are the limitations?*

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*For the use of students considering participating in the project, further information can be found from the following references:*

(please add specific references, max 3)

- 1) Gallo D, Piantanida E, Gallazzi M, Bartalena L, Tanda ML, Bruno A, Mortara L. Immunological Drivers in Graves' Disease: NK Cells as a Master Switcher. *Front Endocrinol (Lausanne)*. 2020 Jul 17;11:406. doi: 10.3389/fendo.2020.00406.
- 2) Gallo D, Bruno A, Gallazzi M, Cattaneo SAM, Veronesi G, Genoni A, Tanda ML, Bartalena L, Passi A, Piantanida E, Mortara L. Immunomodulatory role of vitamin D and selenium supplementation in newly diagnosed Graves' disease patients during methimazole treatment. *Front Endocrinol (Lausanne)*. 2023 Apr 14;14:1145811
- 3) Gallo D, De Vito A, Roncoroni R, Bruno A, Piantanida E, Bartalena L, Tanda ML, Mortara L, Acquati F. A potential role of human RNASET2 overexpression in the pathogenesis of Graves' disease. *Endocrine*. 2023 Jan;79(1):55-59. doi: 10.1007/s12020-022-03207-4

#### **V. Schedule**

*Duration of the project:*

1 month     2 months     3 months

*Frequency: 3 days/week for 6 hours of work per day.*

*Available months:*

January     February     March     April     May     June  
 July     August     September     October     November     December

*How many students can you accept to the project at the same time?*

*Special remarks:*

*students should bring a stethoscope and a white coat*

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**NOTE: a scientific report is required at the end of the program**