Description of Funded Research Projects
1st Call for H.F.R.I. Research Projects
to support Post-Doctoral Researchers

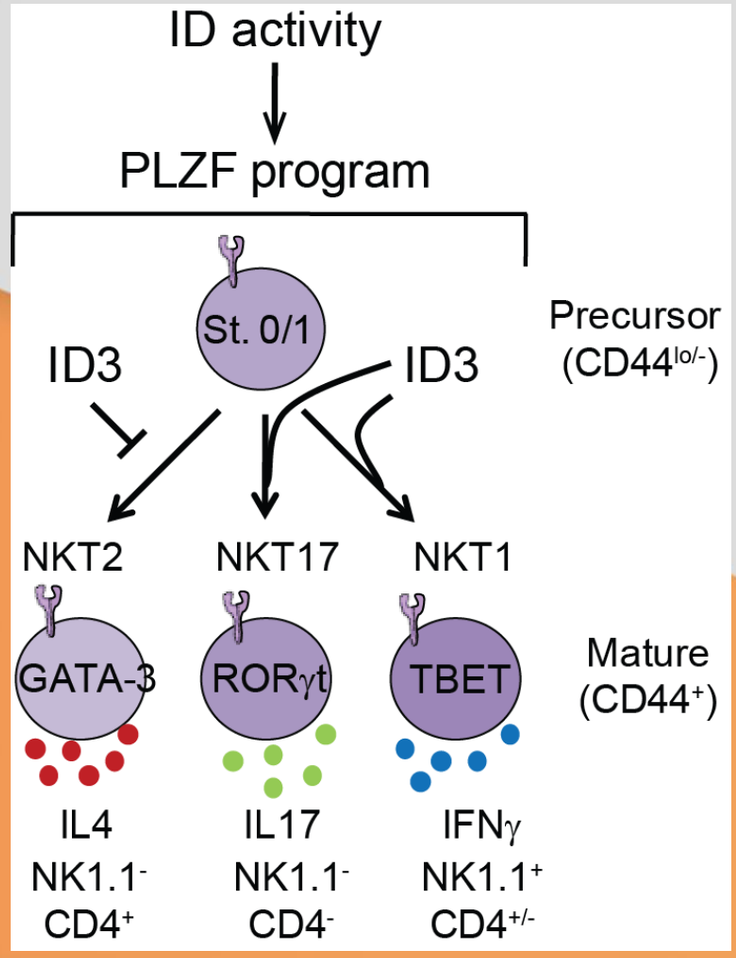
H.F.R.I.
Hellenic Foundation for
Research & Innovation

Research Project Title:

Regulation of innate T cell fates by ID3 and its potential target genes, LEF1 and BCL6

Principal Investigator:

Mihalis Verykokakis



Popular Title:

Molecular mechanisms of white blood cell development

Scientific Field:

Life Sciences

Host Institution:

BSRC "Alexander Fleming"

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CD1d-restricted, lipid-reactive Natural Killer T (NKT) cells constitute a prototypical population of innate-like T lymphocytes that share common developmental pathways with conventional T cells. Innate lymphocyte effector programs are “hard-wired” during development prior to foreign antigen exposure, in sharp contrast to conventional T cells. Their poised state allows NKT cells to produce a vast amount of various cytokines rapidly after activation, thereby influencing the functions of a number of innate and adaptive immune cells and orchestrating the early phases of an immune response.

Although rare, NKT cells can modulate responses to a wide range of diseases, including microbial infection, hematopoietic malignancies, cancer, inflammation and autoimmunity, thus rendering them attractive targets in immune therapies and vaccination strategies. While the functional heterogeneity of NKT cells is starting to be appreciated, the mechanisms involved in the polarization of their effector programs remain unclear. In addition, the precise molecular mechanisms that regulate the acquisition of the innate-like phenotype during development are not fully deciphered. Cell fate is determined by unique gene expression programs that direct the developmental pathway of progenitors, as well as the maintenance, homeostasis and function of mature cells and at the same time repress alternative lineage choices.

Therefore, understanding the developmental and molecular pathways that determine NKT cell effector fate choices and activation is of paramount importance in the research areas of immunology and lymphopoiesis and will help harnessing their immunotherapeutic potential. The current proposal aims at understanding how innate-like lymphocytes utilize the principles of gene expression control to regulate the acquisition of their innate effector programs.

Natural Killer T (NKT) cell lineage represents a T cell subset with innate characteristics that can respond fast to pathogenic infection and modulate the function of other white blood cells. Their unique properties are being explored in vaccination strategies and potential immunotherapies to enhance the adaptive immune response, whereas their chronic activation can lead to autoimmune disorders.

Our studies aim to understand the molecular mechanisms that regulate the developmental pathways of this unique cell type, an important step to fully harness their therapeutic potential and identify alternative ways to intercept the immune response.

To me, H.F.R.I. funding would mean...

The continuous and uninterrupted funding of research projects is an essential part of a successful research career. HFRI funding, which comes to extend previous funding from the European Union and other funding bodies, allows me to continue my research on the molecular mechanisms involved in the biology of innate T lymphocytes, a group of cells with particular developmental and functional characteristics that are not adequately studied.

Through this funding mechanism, I will have the opportunity to develop an international network of collaborators and also assemble a small group of researchers at BSCR "Al. Fleming", who will assist in this project. Hence, this funding opportunity not only contributes to pursuing my research and career goals, but also to the training of the new generation of research scientists in Greece. I am looking forward to further funding opportunities in the near future.

The Principal Investigator,
Mihalis Verykokakis

Funding

Amount: **180,000 €**

Duration: **36 months**

Foundation: **H.F.R.I.**

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