Advance in Cells

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An interview with Dr. Fernando A. Arosa

Advances in Cells Editorial Office

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1. Could you please briefly introduce yourself and your research field? Also, attach a photo, either a portrait or one from your research environment (e.g., laboratory).

I am a Biologist/Biochemist with a PhD in Biomedical Sciences, specialty of Immunology. My research field was always related with the biology of human T cells and HLA class I molecules. More specifically, I have always been interested in the phenotypic and functional features of CD8+ T cells during the process of differentiation in response to TCR-independent signals (e.g., IL-15), which generates subsets of CD8+ T cells with multiple biological and physiological functions. On the other hand, my interest in HLA class I molecules is related to their non-immunological functions, namely the regulation of receptor-mediated endocytosis and the interaction with ligands other than the TCR.

2. What initially sparked your interest in your research field?

My initial experiments during the early 1990s studying CD8+ T cells from patients with Hemochromatosis, a genetic disease caused by a dysregulation of iron metabolism and expansions of CD8+CD28− T cells (10.1046/j.1365-2249.1997.d01-967.x.). In 1996, it turned out that the gene responsible for Hemochromatosis (HFE) encoded for a non-classical HLA class I molecule that was mutated at position 282, abolishing the *cis*-interaction with the receptor for transferrin. Similar functional *cis*-associations between classical HLA class I molecules not associated with β2m and the peptide, that we called *open conformers* (10.1016/j.it.2007.01.002), expressed at the surface, and growth factors and hormone receptors have been described (10.3390/ijms22189738).

3. Could you please briefly share your career story with us? And what impressed you most in your research life?

I started my scientific life in 1990 in the lab of Maria de Sousa in Porto (Pathology and Molecular Immunology Lab, ICBAS, University of Porto). In 1991 and 1995, I visited the laboratories of Christopher E. Rudd (Tumor Immunology Lab Dana Farber Cancer Institute, Boston, USA) and David N. Posnett (Human Molecular Immunology Lab, Cornell University Medical College, New York, USA), respectively. I obtained my PhD in Biomedical Sciences (specialty of Immunology) in 1999 from the University of Porto. After completing two years of post-doctoral training in the laboratory of Maria de Sousa in Porto (Molecular Immunology Lab, Institute for Molecular and Cell Biology, IBMC, University of Porto), I took a position of independent Assistant Researcher in the same Institute. In 2003, I started my own research group, the Lymphocyte Biology Group, and I visited the laboratory of Sandor Damjanovich in Debrecen (Department of Biophysics and Cell Biology, Faculty of Medicine, University of Debrecen, Hungary). Between 2009-2012 I taught Immunology as Invited Assistant Professor at Instituto Superior de Ciências da Saude (ISCS-N, CESPU, Gandra). In 2013, I took a position as an Assistant Professor of Immunology at the Faculty of Medical Sciences of the University of Beira Interior in Covilhã. My research work has focused on the mechanisms of activation, proliferation, survival and differentiation of human CD8+ T cells. It also included the study of the role of effector-memory CD8+ T cells in the modulation of human chronic inflammatory diseases associated with aging. Another area of interest has been the study

of the expression and function of alternative forms of HLA class I molecules (i.e., not associated with b2m) at the plasma membrane of metabolically active cells. Up to know, I have supervised 9 PhD students (two as co-supervisor) and published 47 peer-reviewed scientific articles, 1 immunology book (in Portuguese) and several book chapters.

4. In your opinion, what could be the hot topics in your research field in the coming years?

I anticipate that a deep understanding of phenotypic and functional features of discrete subpopulations of human effector-memory CD8+ T cells expressing variable levels of CD45RA and the CD8β chain by using transcriptomics, epigenomics, and metabolomics, will hot immunology topics (10.3389/fimmu.2020.592656; 10.3389/fimmu.2024.1252439. Besides, studies of the expression and function of cell surface open HLA class I conformers expressed by metabolically active cells, and their relationship with brain homeostasis and cognitive function will be a hot issue in contemporary immunology (10.70322/immune.2025.10004).

5. What valuable suggestions would you like to share with young scholars regarding how to be a professional researcher?

This is a difficult question. However, in my experience, to be a professional researcher you have to be honest and hardworking. You must be very critical with your own results and always cross-check with other's work to warrant that they will be reproducible by other groups. Of course, you need, at a certain point in your career, to be able to attract funding to carry out your own research in an independent manner. Otherwise, you will slowly vanish as a researcher.

6. As a scholar, what recent research trends would you suggest are important for keeping up with *Advances in Cells*?

As I have mentioned, it is of the utmost importance that the scientific community realize that many aspects of the biology of human effector-memory CD8+ T cells and HLA class I molecules are yet to be unveiled. They must be unveiled. These are certainly important research trends for keeping up with *Advances in Cells*.

7. What attracts you to join the editorial board of *Advances in Cells*?

The name of the Journal: Advances in Cells. The knowledge on human effector-memory CD8+ T cells needs to be deepened.

8. What are your thoughts on the future of *Advances in Cells*, an open-access journal?

I am not sure right now. However, if I may, I first would suggest the journal to be indexed to a reputable database like PubMed as soon as possible. Secondly, *Advances in Cells* should focus on future-oriented topics and not repeat themes already covered and exhausted by other journals, where published articles are often iterations of others but with different embellishments. Following this path may be difficult, but in the long run it will be rewarding.