BIOGRAPHICAL SKETCH
Nabila Jabrane-Ferrat, DR1 CNRS

EDUCATION and TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
Joseph Fourier University, Grenoble, France	Ph.D.	1988	Immunopharmacology
Paris VI University-St. Louis hospital, France	Postdoctoral	1989-1990	Cancer Immunology
University of California San Francisco, USA	Postdoctoral	1991-1994	Transcriptional Regulation
University of Toulouse III, FRANCE	HHDR	January 2003	Regulation of gene expression

A. Personal Statement

I am the Director of the Immunology of Pregnancy and Stem Cell, ImPreS Team at the Toulouse Institute for Infectious and Inflammatory Diseases Infinity, INSERM UMR1291 – CNRS UMR5051 – University of Toulouse III. I have a long-standing experience in immune cell biology in health and disease (over 25 years) as well as in immunology of human pregnancy for more than 10 years. I will participate as a PI in all the aspects of the project that are related to immune cell function, and metabolic and mitochondria adjustments during aging.

Major Contributions to Science:

Over the last decade, we have contributed a great deal to the understanding of immune cell biology in health and disease.
Using state-of-the-art approaches and pregnancy tissue samples we revealed the multifaceted function of immune cells cells during pregnancy. Using a cohort of matched tissue-resident and peripheral blood Natural Killer cells from the same pregnant women, we have established that the physiological pool of NK cells can be divided into different subsets governed by the expression of different isoforms of the Natural Cytotoxicity Receptors. We demonstrated that the differential expression of NCR alternatively spliced isoforms, dictated by the local microenvironment, conveys dNK cell subsets with "tolerogenic/helper" functions during pregnancy (Siewiera et al. 2015). Nonetheless, viral threats can hamper the development of the fetal placenta and result in congenital diseases. Our work established that some viruses responsible for congenital infection such as the cytomegalovirus, genotype 1 of hepatitis E virus and Zika virus can use the maternal-fetal interface as a replication platform enabling initial steps of viral amplification before dissemination to the fetal compartment (Siewiera et al. 2013, El Costa et al., 2016, Gouilly et al. 2018, Chen et al. 2020). We also found that tissue-resident immune cells, NK cells, are endowed with high plasticity that allows them to protect fetal cells from invading pathogens (Siewiera et al; 2013, Espino et al. 2022).

Our investigations of immune cell phenotype and function revealed that the central role of effector memory cells and the exacerbated inflammatory response governs the pejorative outcome of viral infection in the elderly population (El Costa et al. 2022). More recently, we have established that aging is associated with major changes in the immunometabolism of the effector memory cells and their mitochondrial fitness (unpublished data)

URL for PubMed publications:
https://www.ncbi.nlm.nih.gov/pubmed/?term=jabrane-ferrat

D. RESEARCH SUPPORT

POSITIONS

1995–1996	Adjunct Assistant Prof, Departments of Medicine and Microbiology-Immunology, University of California Medical Center, San Francisco, California, USA
1997–2002	Adjunct Assistant Prof, Department of Surgery, University of California Mount Zion Cancer Center, San Francisco, California, USA
2003-2014	Associate Professor/CNRS Researcher, Centre National de Recherche Scientifique, Toulouse, France
2014-present	Professor/Research director, Centre National de Recherche Scientifique, Toulouse, France

HONORS

Member of the European Commission:

Vice Chair, Horizon Europe Pathfinder and EIC Transition (Active)

Vice Chair HORIZON 2020 FET Open-Novel Ideas for Radically new technologies, since 2014

External Expert HORIZON 2020 FET Open-Novel Ideas for Radically New Technologies, 2011-2014

Others International/National recognition:

Grant Reviewing (Welcome Trust, Association de Recherche sur le Cancer, Ligue contre le Cancer, Agencede Biomédecine, French Agence Nationale de la Recherch, Israeli Science Foundation.

Scientific reviewer (Am J Pathol, Arch Pathol Lab Med, Emerg Infect Dis, Frontiers in Immunology, Hepathology, Immunology, J Infect Dis, J Invest Dermatol, Lancet Infect Dis, PLoS Pathogens, Scientific Reports).

Associated Editor for Scientific Reports.

Most relevant publications

(Complete list can be found @https://www.ncbi.nlm.nih.gov/pubmed/?term=jabrane-ferrat)

1. Jabrane-Ferrat N, El Costa H. Decidua Basalis: An Ex Vivo Model to Study HIV-1 Infection During Pregnancy and Beyond. Methods Mol Biol. 2022;2407:205-213. doi: 10.1007/978-1-0716-1871-4_15.
2. Espino A, El Costa H, Tabiasco J, Al-Daccak R, Jabrane-Ferrat N. Innate Immune Response to Viral Infections at the Maternal-Fetal Interface in Human Pregnancy. Front Med (Lausanne). 2021 Jul 22;8:674645. doi: 10.3389/fmed.2021.674645.
3. Manchon E, Hirt N, Bouaziz JD, Jabrane-Ferrat N, Al-Daccak R.Stem Cells-Derived Extracellular Vesicles: Potential Therapeutics for Wound Healing in Chronic Inflammatory Skin Diseases. Int J Mol Sci. 2021 Mar 19;22(6):3130. doi: 10.3390/ijms22063130.
4. El Costa H, Gouilly J, Abravanel F, Bahraoui E, Peron JM, Kamar N, Jabrane-Ferrat N, Izopet J. Effector memory CD8 T cell response elicits Hepatitis E Virus genotype 3 pathogenesis in the elderly. PLoS Pathog. 2021 Feb 22;17(2):e1009367. doi: 10.1371/journal.ppat.1009367.
5. Chen Q et al. Metabolic reprogramming by Zika virus provokes inflammation in human placenta, Nat Commun 2020, doi: 10.1038/s41467-020-16754-z.
6. Jabrane-Ferrat N, Veas F. Zika Virus Targets Multiple Tissues and Cell Types During the First Trimester of Pregnancy. *Methods Mol Biol*. 2020. doi: 10.1007/978-1-0716-0581-3_18.
7. Jabrane-Ferrat N. Features of Human Decidual NK Cells in Healthy Pregnancy and During Viral Infection. *Front Immunol*. 2019 Jun 28;10:1397. doi: 10.3389/fimmu.2019.01397.
8. Mansuy JM, El Costa H et al. Peripheral Plasma and Semen Cytokine Response to Zika Virus in Humans. *Emerg Infect Dis*. 2019, doi: 10.3201/eid2504.171886.
9. Gouilly J. et al. Genotype specific pathogenicity of hepatitis E virus at the human maternal-fetal interface *Nat Commun* 2018, doi: 10.1038/s41467-018-07200-2.
10. El Costa H., Gouilly J. et al. ZIKA virus reveals broad tissue and cell tropism during the first trimester of pregnancy. *Sci Rep.* 2016, doi: 10.1038/srep35296.
11. Siewiera J. et al. Natural cytotoxicity receptor splice variants orchestrate the distinct functions of human natural killer cell subtypes. *Nat Commun* 2015, doi: 10.1038/ncomms10183.

12. Siewiera J. et al. Human cytomegalovirus infection elicits new decidual natural killer cell effector functions. *Plos Pathogens* 2013, doi: 10.1371/journal.ppat.1003257.

RESEARCH SUPPORT

Principal Investigator Ongoing Research Support

Region Occitanie 2022-2023 "Mitochondrial function and energy metabolism in the INSPIRE-T cohort:

cross-sectional and prospective associations with frailty and intrinsic capacity domains"

Inspire, Feder-Geroscience Toulouse Occitanie 2021-2022 The goal of this proposal is to define the role of Respiratory chain complex V activity in mitochondrial in inducing accelarated aging

FRM- Environnement-Santé ENV202003011510 2021-2023. The application aims at defining the Impact des perturbateurs endocriniens sur le fonctionnement du placenta au cours de la gestation
Jabrane-Ferrat, Principal Investigator and Coordinator

ANRS-ECTZ103104 & ECTZ103440 2019-2022. The goal of the proposal is to investigate the role of the mucosal immune system in the pathogenicity of Hepatitis E viral of the maternal-fetal interface. N Jabrane-Ferrat, Principal Investigator

ERA-NET Cofund, INTIMIC "Impact of MEditerranean Diet, Inflammation and Microbiome on plaque vulnerability and microvascular dysfunction after an Acute Coronary Syndrome. A randomized, controlled, mechanistic clinical trial", (Associated Investigator).

Principal Investigator Completed within the Last 3 Years

Agence de biomédecine R16129BB, N Jabrane-Ferrat, Principal Investigator 2016-2020 (Principal Investigator)

REACTing (REsearch and ACTion targeting emerging infectious diseases) **Zika Virus,** Aviesan ITMO I3M, France, 2016-2017, (Principal Investigator).

Institutional emergency funding Zika virus and pregnancy, 2016-2017 (Principal Investigator)