BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors. Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Zyulina, Victoria

eRA COMMONS USER NAME (credential, e.g., agency login): ZYULINA_V

POSITION TITLE: Research Assistant Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Hospital for Special Surgery	Postdoctoral	05/2023	Immunology
Medical University of Graz, Austria	Ph.D.	07/2021	Medical Sciences
First Moscow State Medical University I.M. Sechenov, Russia	MD	08/2016	Human medicine

A. Personal Statement

As a member of Ana Fernandez-Sesma lab, I'm currently working on studying innate and adaptive host innate immune responses to Influenza, SARS-CoV-2 and Dengue virus in *ex vivo* primary immune cells and pre-clinical model systems. I'm involved in collaborative projects at The Viral Immunity and Vaccination (VIVA) Human Immunology Project Consortium (HIPC) - a comprehensive systems immunology program to assess the dynamic human immune response to SARS-CoV-2, seasonal influenza viruses and tetravalent and trivalent dengue vaccines and subsequent infections by those pathogens. As part of this program, I'm working on generating comprehensive innate, cellular and adaptive immune signatures that correlate with vaccine outcomes. My research in the lab involves studying pathogenesis and transmission of influenza viruses in humans as part of The Center for Research on Influenza Pathogenesis and Transmission (CRIPT).

During my research career, I have been focused on immune cell development and discovered which pathways transcriptional regulate dendritic cell function. Given the expertise in human *in vitro* cell differentiation I would like to incorporate it into studying clinically relevant infectious diseases. This physiologically relevant in vitro hematopoietic stem cell model will enable to study the contribution of specific genetic and environmental aspects of immune response to different viruses. This brings a new line of research into Microbiology department of ISMMS with an opportunity to promote interdepartmental collaborations with other faculty members that are focused on mosquito -borne and respiratory infections that cause economic burden and millions of deaths worldwide.

Positions, Scientific Appointments, and Honors

Positions and Scientific Appointments

2024-current Assistant Professor, Research track, Department of Microbiology, ISMMS, New York, NY
2023-2024 Instructor, Department of Microbiology, ISMMS, New York, NY
2021- 2023 Postdoctoral fellow, Hospital for Special Surgery, New York, NY
2016-2021 PhD in Medical Sciences, Medical University of Graz, Austria, Dr. Herbert Strobl, PhD advisor
2015-2016 Residency in internal medicine, First Moscow State Medical University I.M. Sechenov, Russia
2009-2015 Medical Doctor, First Moscow State Medical University I.M. Sechenov, Russia

Other Experience and Professional Memberships
Teaching:

Lecturer, Graduate School of Biomedical Sciences ISMMS (BMS), Advanced virology (2024)
Lecturer, Pathophysiology, First Moscow State Medical University I.M. Sechenov, Russia (2015)

Memberships: American Association of Immunologists (AAI), Austrian Society for Allergology and Immunology (OGAI), Next Generation Immunologists Society

Honors
2019 Austrian Marshall Plan Scholarship
2022 Erwin Schrodinger Scholarship
2022 Austrian Scientists & Scholarships in North America mentoring program laureate

C. Contributions to Science

1. Delignating mechanisms of immune cell differentiation and function
During her graduated and postdoctoral studies, Dr. Zyulina have been focused on immune cell development and discovered that a small non-coding RNA- miRNA 424- defines the hematopoietic stem cell fate in human and mice. MicroRNAs are small non-coding RNAs, which regulate key biological processes in immune cells and define their functions. The role of individual microRNAs in these processes remains poorly understood. She was the first one to show that miRNA-424 is required for differentiation of inflammatory-type of immune cells which are known

to be important players in skin diseases like psoriasis and atopic dermatitis. She established collaboration between Medical University of Graz (Austria) and Icahn school of Medicine in Mount Sinai (US) to address how deficiency of this microRNA can impact the immune cell phenotype. She first validated this discovery in a clinically relevant model of psoriasis-like inflammation in mice, showing that microRNA-424 knockout mice exhibit impairment of immune cell differentiation.

2. Investigating viral and vaccine determinants that drive the quality of host innate immune responses in ex vivo primary immune cells and pre-clinical model systems.

Currently Dr. Zyulina is investigating mechanisms of innate immunity in the context of Influenza and Dengue viruses. Mosquito-borne diseases are transmitted to humans via the bite of an infected mosquito. The burden of moscquito-borne diseases results in almost 700 million cases and more than a million deaths each year. This includes the Dengue virus (DENV) that have triggered historically largest outbreak of in Argentina and Brazil that is still ongoing. Immune response that occurs in the skin upon infected mosquito-bite is a crucial determinant defining subsequent systemic course and clinical outcome of the virus infection. To date, little is known about the first cells targeted by mosquito-borne viruses in the skin as well as subsequent dissemination of the virus to other target cells. This study leverages recent advances in immunology research in order to delineate how skin microenvironment regulates systemic immune response to viral infections. There is a technical innovation in utilizing hematopoietic stem cell derived dendritic cells to understand skin-derived signals that can impact the viral pathogenesis.

The main focus of her research is investigating viral and vaccine determinants that drive the quality of host innate immune responses in ex vivo primary immune cells and pre-clinical model systems. As part of the VIVA HIPC team, our multidisciplinary approach seeks to understand key innate immune and adaptive responses involved in eliciting a broad and durable immune response. This research will leverage recent advances in human immune profiling methods to characterize the diverse states of the human immune system before and after vaccination against these viral pathogens of great public health concern using novel immune phenotyping and genomics strategies that generate data and tools to be used for downstream data analysis and functional investigations. Ultimately, this research lays the groundwork for next-generation vaccines and antiviral therapies at the forefront of microbiology and infectious disease

1) Sconocchia T, Hochgerner M, Schwarzenberger E, Tam-Amersdorfer C, Borek I, Benezeder T, Bauer T, Zyulina V, Painsi C, Passegger C, Wolf P, Sibilia M, Strobl H. Bone morphogenetic protein signaling regulates skin inflammation via modulating dendritic cell function. J Allergy Clin Immunol. 2020 Oct 22:S0091-6749(20)31450-0. doi: 10.1016/j.jaci.2020.09.0

2) Novoszel P, Holcmann M, Stulnig G, Fernandes C, Zyulina V, Borek I, Linder M, Bogusch A, Drobits B, Bauer T, Tam-Amersdorfer C, Brunner P, Stary G, Bakiri L, Wagner E, Strobl H, Sibilia M. Psoriatic skin inflammation is promoted by c-Jun/AP-1 dependent CCL2 and IL-23 expression in Dendritic cells. EMBO Molecular Medicine, 2021 March doi:10.15252/emmm.202012409

3) Zyulina V, Yan K, Ju B, Passegger C, Tam-Amersdorfer C, Pan Q, Sconocchia T, Pollack C, Shaner B, Zebisch A, Easton J, Yu J, Silva J, Strobl H. miR-424(322) regulated pro-inflammatory vs anti- inflammatory skin DC subset differentiation by modulating TGF-β signaling. Cell Rep. 2021 Apr 27;35(4):109049. doi: 10.1016/j.celrep.2021.109049.

4)Hochgerner M*, Bauer T*, Zyulina V, Glitzner E, Warsi S, Konkel JE, Tam-Amersdorfer C, Chen W, Karlsson S, Sibilia M, Strobl H. BMPR1a is required for the optimal TGF-β1 dependent CD207+ Langerhans cell differentiation and limits skin inflammation via CD11c+ cells. J Invest Dermatol. 2022 Mar 14:S0022-202X(22)00195-6. doi: 10.1016/j.jid.2022.02.014.

5) Li, T.* M., Zyulina, V.*, Seltzer, E. S.*, Dacic, M., Chinenov, Y., Daamen, A. R., Veiga, K. R., Schwartz, N., Oliver, D. J., Cabahug-Zuckerman, P., Lora, J., Liu, Y., Shipman, W. D., Ambler, W. G., Taber, S. F., Onel, K. B., Zippin, J. H., Rashighi, M., Krueger, J. G., Anandasabapathy, N., … Lu, T. T. (2024). The interferon-rich skin environment regulates Langerhans cell ADAM17 to promote photosensitivity in lupus. eLife, 13, e85914. https://doi.org/10.7554/eLife.85914

*These authors share first authorship

Complete List of Published Work
https://pubmed.ncbi.nlm.nih.gov/?term=victoria+zyulina

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