BIOGRAPHICAL SKETCH

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NAME: Bing Wang

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POSITION TITLE: Postdoctoral Scholar

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)*	Start Date MM/YYYY	Completion Date MM/YYYY	FIELD OF STUDY
Hunan Normal University, CN	BS	09/2012	07/2017	Laboratory Medicine
Peaking Union Medical College, CN	Ph.D.	09/2017	07/2022	Immunology
Stanford University, US	Postdoctoral Scholar	10/2022	Present	Immune and stem cell therapy

A. Personal Statement

My academic training and research experience have equipped me with multidisciplinary skills and knowledge of molecular biology and immunology.

I led two projects when I was an undergraduate, in which I got primary academic learning. My team member and I investigated the bacteria content in drinking water from two types of machines that are commonly used in colleges under the guidance of our experimental microbiology teacher Zhihong Zhong. Secondly, we produced a hybridoma cell line secreting monoclonal antibodies against the core antigen of the hepatitis C virus (HCV) to develop an ELISA kit for the detection of HCV under the guidance of Dr. Rushi Liu and Minjing Liao.

Thereafter, as a Ph. D. candidate at Xiaoming Feng's lab, my research primarily focused on understanding the biology of regulatory T cells (T_{reg}) and CD11c+ myeloid cells using cutting-edge single-cell sequencing and conditional knockout mice under healthy and disease conditions. We first revealed the heterogeneity and bifurcated differentiation pathway of human T_{regs} from normal donors and transplanted patients at the single-cell transcriptome level. A subsequent first and corresponding author publication identified a key innate responsive protein in CD11c+ alveolar macrophages, NRP2, that protects mice from lung injury by promoting the phagocytosis of neutrophils. I also participated in two projects regarding the role of a serine/threonine kinase, LKB1, in mice CD11c+ dendritic cells from lymphoid tissues and adipose tissue with diet-induced obesity. These academic experiences guided me a strong passion and independent capacities in biomedical studies.

For my postdoctoral training, I will focus on developing T_{reg} therapies and genetic stem cell therapy to cure patients with IPEX syndrome (a severe and early-onset autoimmune disease) at the preclinical and clinical stage, and other immune disorders. My sponsor Dr. Rosa Bacchetta is a well-known leader in treating IPEX patients and developing T_{reg} therapies. My co-mentor Dr. Maria Grazia Roncarolo is a well-recognized pediatric immunologist and one of the pioneers in the stem cell and gene therapy field, who discovered the type 1 regulatory T cells or Tr1 cells and translate the scientific discoveries into novel T_{reg} therapies. Both have an excellent record of training postdoctoral fellows. The proposed projects will provide me with great opportunities in cutting-edge technology and translational research and outline a set of career development including grant writing, public presentation, and lab management, which will enhance my ability to become an independent investigator and help me to reach my goal of developing efficient and safe T_{reg} therapies for a wide range of immune disorders and associated human diseases.

B. Positions, Scientific Appointments and Honors

Positions and Scientific Appointments

10/2022 – Present Postdoctoral Scholar Stanford University

Honors

2022 Outstanding Graduate Award, Peaking Union Medical College
2017-2022 Scholarship (4 times), Peaking Union Medical College
2017 Outstanding Graduate Thesis Award, Hunan Normal University
2012-2017 Scholarship (3 times), Hunan Normal University

C. Contributions to Science

1. Treg biology: I worked with a team to resolve the heterogeneity and differentiation of human Treg cells. My role in the project was to explore the features of newly defined subsets and differentiation trajectories based on the single-cell transcriptome, compare the differences between Tregs from healthy and patients with graft versus host diseases after hematopoietic stem cell transplantation, conduct the experimental validations, and manuscript preparation throughout the publication process.

Luo Y †, Xu C †, **Wang B †,** Niu Q †, Su X †, Bai Y, Zhu S, Zhao C, Sun Y, Wang J, Liu M, Sun X, Song G, Cui H, Chen X, Huang H, Wang H, Han M *, Jiang E *, Shi L *, Feng X *. Single-cell transcriptomic analysis reveals disparate effector differentiation pathways in human Treg compartment. Nat Commun.12,3913 (2021).

2. The biological role of LKB1 in CD11c+ myeloid cells: We identified Lkb1 as a regulatory switch in dendritic cells for controlling Treg cell homeostasis, immune response, and tolerance. Loss of Lkb1 in CD11c+ dendritic cells leads to a remarkable expansion of the Treg pool. The proliferation of Treg cells from $CD11c^{cre}$ $LKB1^{flox/flox}$ mice is partially mediated by the increased expression of OX40L in LKB1-/- dendritic cells in a cell-cell contact manner. In this project, my contribution was to validate the expression of the upregulated OX40L in LKB1-/- dendritic cells and participate in some in vivo experiments and manuscript preparation [a]. Given the critical role of Lkb1 in dendritic cells to regulate the Treg pool, we further investigated its role in diet-induced obesity and found that Lkb1 is essential for fat CD11c+ dendritic cells but not macrophages responding to HFD exposure and regulates the balance of IL-17A and IFN-γ. In this project, I performed the qPCR test and gave support in flow, intracellular staining, and tissue immune cell isolation. I designed the experiments and analyzed the experimental data and wrote the manuscript [b].

a. Chen S †, Fang L †, Guo W †, Zhou Y, Yu G, Li W, Dong K, Liu J, Luo Y, **Wang B**, Li Z, Zhao C, Sun Z, Shen Y, Leng Q, Zhou D, Han Z, Huang H, Ren H *, Xu G *, Feng X *. Control of Treg cell homeostasis and immune equilibrium by Lkb1 in dendritic cells. Nat Commun.9,5298 (2018).

b. Yunyan Sun †, **Bing Wang †,** Qianwen Hu Xun Lai, Tier Wang, Chunxiao Zhao, Jiali Wang, Xi Zhang, Qing Niu, Baolin He, Mingxia Shi *, Xiaoming Feng *, Yuechen Luo *. Loss of Lkb1 in CD11c+ myeloid cells protect mice from diet-induced obesity while enhancing glucose intolerance and IL-17/IFN-γ imbalance. *Cellular and molecular life sciences* 80 (3): 63 (2023)

3. Infection immunity: We revealed the alveolar macrophage derived NRP2 protects the lungs from unwanted injury by promoting the clearance of invading pathogens. My major contribution was to breed the genetic conditional knockout mice, acquire and process the experimental data, and write the manuscript.

Wang B †*, Guo W, Qiu C, Sun Y, Zhao C, Wu C, Lai X*, Feng X*. Alveolar macrophage derived NRP2 curtails lung injury while boosting host defense in bacterial pneumonia [J]. J Leukoc Biol, 112(3):499-512 (2022).

† Represents the first or co-first author.
***** Indicates the corresponding author.

D. Scholastic Performance

YEAR	COURSE TITLE	GRADE
PEAKING UNION MEDICAL COLLEGE		
2017	Cell Biology Lecture	93
2017	The Basics of Proteomics	84
2017	The Application of Proteomics	95
2017	Molecular Biology of the Gene	84
2017	Presentation Skills in Medicine	89
2017	Medical Literature Retrieval (Basic Medicine)	90
2017	Medical Immunology	89
2017	Stem Cell Biology	95
2017	The Theory and Practice of Socialism with Chinese Characteristics	87
2017	Philosophy of Science and Technology	92
2017	Advanced English Listening for Master Students	EXEMPT
2017	Advanced English Reading and Writing for Master Students	EXEMPT
2017	Cell Therapy	91
2017	Specialized Course (Master Students)	87
2017	Specialty English (Master Students)	91
2017	Literature Review (Master Students)	75
2017	Signal Transduction	95
2019	Experimental Hematology	88
2019	Clinical Pharmacology for New Drugs	79
2019	Contemporary Marxism	83
2019	An Anthology of Marxist Classics	86
2019	Advanced English for Ph.D. Students	EXEMPT
2019	Research Integrity and Academic Morality	78
2019	Specialized Course (Ph.D. Students)	80
2019	Specialty English (Ph.D. Students)	94
2019	Literature Review (Ph.D. Students)	88

Note: 100 is the full mark and EXEMPT means course exemption.