

## Short Biography: Zihai Li, M.D., Ph.D.

**D**r. Zihai Li (Chinese name: 李子海) obtained his M.D. from Henan Medical University, China, and his Master of Medicine degree at Peking Union Medical College and the Chinese Academy of Medical Sciences. He studied under the mentorship of the late Prof. Shaowen Xie (*aka* Samuel Zia, a Harvard-trained *Rickettsia* microbiologist who was regarded as the father of microbiology in China). Afterward, he obtained his Ph.D. in immunology from the Mount Sinai School of Medicine in New York. He then completed his clinical training in internal medicine at the Montefiore Medical Center of the Albert Einstein College of Medicine, New York, and in medical oncology at the Fred Hutchinson Cancer Research Center and University of Washington, Seattle. After 11 years of running a NIH-funded tumor immunology laboratory at the University of Connecticut School of Medicine, he was recruited to his current institution in 2010 and is now a tenured professor and chair of Department of Microbiology and Immunology at the Medical University of South Carolina. Dr. Li is also an endowed chair in stem cell biology and the program leader of the Cancer Immunology program at the National Cancer Institute (NCI)-designated Hollings Cancer Center in Charleston, South Carolina, USA.

Dr. Zihai Li is a board-certified medical oncologist who continues to provide clinical service to cancer patients whilst maintaining an active laboratory. His laboratory is primarily interested in the mechanism of immune regulation by the innate immune system in the context of cancer, infection, and autoimmune disease. His research team has made seminal contributions to understanding the immunological properties of heat shock proteins (HSPs) in cancer immunotherapy and immune tolerance. They provided the first genetic evidence linking the heat shock response to antigen cross-presentation and adaptive immunity; pioneered the use of autologous tumor-derived HSP70-peptide complex for the immunotherapy of human leukemia; and discovered that HSP gp96 (known also as grp94 and HSP90b1) in the endoplasmic reticulum is the master molecular

chaperone for Toll-like receptors (TLRs). Furthermore, through transgenic mouse models, they have illuminated the importance of the subcellular localization of gp96 in regulating T cell tolerance and systemic lupus erythematosus. They have uncovered several crucial aspects of the molecular mechanism of gp96 in folding TLRs, including their successful mapping of the TLR-binding domain of gp96 and molecular defining the elusive co-chaperone in the process. In addition, they have demonstrated the essential roles of gp96 in regulating lymphopoiesis and thrombopoiesis. This work has broad implications in understanding how the immune system operates physiologically and how it might be harnessed for the prevention and treatment of human diseases considering the critical roles of TLRs in the regulation of immune response. Recently, his laboratory has also developed interests in the biology and application of stem cells including pluripotent stem cells and adult stem cells in cancer, as well as in inflammation and tissue repair. They have identified a crucial role of gp96 in Wnt and TGF $\beta$  pathway, and thus in regulating intestinal homeostasis and regulatory T cell function respectively. Dr. Li's work in gp96 biology (discovered its ATPase activity, peptide-binding properties, its co-chaperone CNPY3, its client-binding domain and its client network including integrins, TLRs, GPIb-IX-V complex, LRP5/6, and GARP) has positioned his team as global leaders in this field.

Dr. Li has published on the topics of tumor immunology, immune tolerance, and HSP biology in journals such as EMBO J, J Exp Med, Immunity, Blood, J Clin Invest, J Biol Chem, Nat Med, J Immunol and Nat Commun. He is an elected member of the prestigious American Society of Clinical Investigation and served as a regular member for the NIH Innate Immunity and Inflammation study section. He is also a co-founder and the founding chair of the board of directors of the Chinese American Hematologist and Oncologist Network. He is an associate editor-in-chief of Journal of Hematology & Oncology, and is co-editor-in-chief of Experimental Hematology & Oncology.