



Vaccination is one of the most significant inventions in medical science. Early forms of vaccination were developed in ancient China and India as early as 200 B.C, when vaccination with powdered scabs from people infected with smallpox was used to protect the healthy against the disease. Edward Jenner first used the word vaccination in 1796 to specifically describe the injection of smallpox vaccine. The germ theory of human infectious disease of Louis Pasteur facilitated the development of various types of vaccines over the past 150 years.

The concept of vaccines led to the understanding of the immune system, which in turn resulted in the founding of the field of immunology. For a century, immunologists have enhanced understanding of the immune system, from the specificity and diversity of humoral and cellular adaptive immunity to the pattern recognition of innate immunity. Immunology has become an integral component of medical science, deepening understanding of the pathophysiology of human diseases. It has also contributed to the development of modern therapeutics for such conditions as infection, autoimmune diseases, allergy and cancer.

To celebrate the 60th anniversary of *SCIENCE CHINA*, immunologists working in and out of China have jointly contributed six articles, which provide an overview of recent advances in immunology, highlighting the contributions of leading Chinese immunologists.

Prof. CHENG GenHong, who discovered the function of TRAF and other signaling molecules in TLR signaling and innate inflammation, contributed the first chapter regarding the structure and function of the TRAF family [1]. Prof. LIU Yang, who provided the first experimental evidence that microbial recognition by the innate immune system turns on the adaptive immune system, contributed the second chapter explaining how the immune system controls the balance between sensing microbial-associated molecular patterns and the self-danger-associated molecular pattern [2]. Prof. LIU YongJun, contributed the third chapter regarding the discovery of plasmacytoid dendritic cells (pDCs), a key cell type in anti-viral innate immunity [3]. Prof. CHEN LiePing, who discovered various co-stimulatory molecules in T cell activation, contributed the fourth chapter concerning the function of the B7/CD28 family in the regulation of adaptive immunity [4]. Prof. FU YangXin contributed the fifth chapter regarding the role of the adaptive immune system in negative regulation of the innate immune response [5]. Prof. SU LiShan contributed the final chapter explaining the establishment of a new generation of humanized mice, an animal model for studying the human immune system and human diseases *in vivo* [6].

We would like to take this opportunity to thank all of the co-authors of this review series, for their assistance with the findings mentioned above. We regret that this special topic for *SCIENCE CHINA Life science* lacks space for more articles by Chinese immunologists, whose work has been respected by immunologists around the world.

**Prof. CHENG GenHong**

Department of Microbiology, Immunology & Molecular Genetics, University of California Los Angeles,  
609 Charles E. Young Drive East, Los Angeles, California 90095, USA  
Email: genhongc@microbio.ucla.edu

**Prof. LIU YongJun**

Department of Immunology and Center for Cancer Immunology Research, University of Texas,  
M.D. Anderson Cancer Center, Houston, Texas 77030, USA  
Email: yjliu@mdanderson.org

**Prof. TANG Hong**

Key Laboratory of Infection and Immunity, Institute of Biophysics, Chinese Academy of Sciences, Beijing 100101, China  
Email: tanghong@moon.ibp.ac.cn

- 1 Wang Y Y, Zhang P, Liu Y F, *et al.* TRAF-mediated regulation of immune and inflammatory responses. *Sci China Life Sci*, 2010, 53: 159–168
- 2 Liu Y, Chen G Y, Zheng P, *et al.* On self-nonsel self discrimination in pattern recognition. *Sci China Life Sci*, 2010, 53: 169–171

- 3 Tang F, Du Q M, Liu Y J. Plasmacytoid dendritic cells in antiviral immunity and autoimmunity. *Sci China Life Sci*, 2010, 53: 172–182
- 4 Wang S D, Chen L P. Structural immunology of costimulatory and coinhibitory molecules. *Sci China Life Sci*, 2010, 53: 183–189
- 5 Tang H, Fu Y X. A new role for T cells in dampening innate inflammatory responses. *Sci China Life Sci*, 2010, 53: 190–194
- 6 Zhang L G, Meissner E, Chen J Z, *et al.* Current Humanized Mouse Models for studying human immunology and HIV-1 immuno-pathogenesis. *Sci China Life Sci*, 2010, 53: 195–203

### ***Author's Biographical Sketch***

Dr. CHENG GenHong is now a professor at the Department of Microbiology, Immunology & Molecular Genetics, University of California Los Angeles. Prof. CHENG is also an adjunct professor and the co-director of the Center for Infection and Immunity, Institute of Biophysics, Chinese Academy of Sciences.

Prof. CHENG obtained his PhD degree from Albert Einstein College of Medicine and did his postdoc work in the Laboratory of David Baltimore at both Rockefeller University and MIT. His research interests include signal transduction and gene expression networks through the TNF receptor (TNFR), Toll-like receptor (TLR), Nod like receptor (NLR), and RIG-I like receptor (RLR) families during host innate and adaptive immune responses against pathogen infections and cancers. Prof. Cheng has published more than 100 peer-reviewed papers or book chapters.



Dr. LIU YongJun is currently the Vivian L. Smith Distinguished Chair in Immunology, Professor and Chairman of the Department of Immunology, and the Director for the Center of Cancer Immunology Research (CCIR) at UT. MD Anderson Cancer Center.

Dr LIU obtained PhD of Immunology in 1999, and had two years of postdoctoral fellowship at University of Birmingham, UK. He made several important contributions to the field of germinal center biology during antigen-specific antibody responses. In 1991, he joined Schering-Plough Laboratory for Immunology Research. His laboratory defined the human B cell subsets, and the signals regulating germinal center B cell expansion and differentiation. These studies provide the corner stones for human B cell biology and B cell tumors. In 1997, his laboratory isolated plasmacytoid dendritic cells (pDCs) from human lymphoid tissues. In 1997, Dr. Liu moved his laboratory to DNAX, Palo Alto and discovered that plasmacytoid dendritic cells (pDCs) function as the professional type 1 IFN-producing cells (IPC). His laboratory identified a cytokine TSLP, as the master trigger of DCs-mediated inflammatory TH2 in allergic diseases. At the UT, MD Anderson Cancer Center, his laboratory discovered the essential role of TSLP in regulating DC-mediated CD4<sup>+</sup> T cell homeostasis in the periphery and positive selection of the Foxp3<sup>+</sup> regulatory T cells in the thymus. He is also directing a Cancer Immunology Center (CCIR) for translating basic immunology to the development of immunotherapy for human cancers. He authored more than 200 scientific publications.



Dr. TANG Hong is currently the Professor and Chairman of the Key Laboratory of Infection and Immunity (CASKLII) at the Institute of Biophysics, Chinese Academy of Sciences, Beijing.

Dr. TANG obtained PhD of Microbiology and Molecular Genetics in Rutgers University, and had three years of postdoctoral fellowship at MIT. His research interests include the signaling mechanisms underlying the innate immune response to virus infection, and how the adaptive immune system is involved in regulation of the innate inflammatory responses. Dr. TANG has authored more than 30 peer-reviewed papers or book chapters. He is also directing a Center for Infection and Immunity (CII) at the Institute of Biophysics which is committed to develop immuno-interventions against human viral hepatitis and cancers.

