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Trends and Policy

China goes back to basics on research funding in major infectious diseases

According to Premier Li Keqiang's speech, the central government's expenditure on science and technology this year was set at US$43.6 billion, an 8.9% rise on last year. The biggest winners are 16 'megaprojects', two of which are in the areas of drug discovery and **major infectious diseases. And with a combined budget of $488 million, the two initiatives "will continue to strengthen the capacity for drug screening, rapid detection of pathogens and vaccine development"**, says Liu Qian, deputy director of the National Health and Family Planning Commission.

President Xi visits Biomerieux research center in France

Chinese President Xi Jinping visited Biomerieux research center in Lyon during his trip to France on 26 March, 2014. The Chinese leader said China and France have been undertaking frequent exchanges, and sharing broad prospect in boosting their cooperation in the health sector. For decades, the center has been working with relevant Chinese agencies in such fields as tuberculosis prevention and treatment, **infection control and emerging infectious diseases control.** The two sides have been running production and research base in the Chinese metropolitan of Shanghai and a **P4 biosafety lab in Wuhan city in Central China.**

Progress and Innovation

Isolation and characterization of a bat SARS-like coronavirus that uses the ACE2 receptor

Prof. Shi Zhengli

An international study group, led by Chinese researcher Shi Zhengli from WIV, CAS, has isolated a SARS-like coronavirus from the Chinese horseshoe bat, a species widespread in China and southeast Asia. The latest study results published on Nature, 503: 535-538 confirm a 2005 research that says bat species are natural hosts of coronaviruses closely related to SARS, which are far more closely related to SARS-CoV than any previously identified.

Center for Emerging Infectious Diseases (CEID), which is headed by Dr. Shi Zhengli, is one of the five centers of WIV, undertaking many major S&T programs at home and abroad, such as 973, 863, NFSC Projects, etc. CEID is also the key center responsible for the operation of National Center for International Research, one of the earliest International Research Bases authorized by MOST.

Focusing on etiology isolation, identification, collection, diagnosis, animal model, pathogenesis, and the pre-research on anti-viral drug, CEID, is devoted to national prevention and control of emerging infectious diseases and public health.

Progress in innate immune pathway regulation

Dr. Chen Honghe and her mentor Prof. Chen Xinwen

The research team led by **Prof. Chen Xinwen** from WIV recently made great progress in innate immune pathway regulation, identifying an alternatively spliced isoform of MITA lacking exon 7, termed MITA-related protein (MRP), the findings of which has been published in the internationally prestigious journal, namely, *The Journal of Immunology*.

The team identified an alternatively spliced isoform of MITA, designated as MITA-related protein (MRP), and examined the function of MRP in the context of MITA-mediated signaling. The results suggested that MRP acts largely as a dominant negative mutant of MITA and blocks MITA-mediated IFN induction via TBK1/IRF3 by disrupting the MITA–TBK1 interaction. However, MRP retained the ability to activate NF-kB. Their findings provide a new mechanism for the negative regulation of MITA-mediated signaling.

Are T lymphocytes also innate immune cells?


Feng Jin, Zhang Chao and Zhang Weihong

Recently, a series of studies from **Prof. Tang Hong's lab** indicate that innate-like T lymphocytes play a pivotal role in the maintenance of homeostasis of innate inflammatory responses.
In sterile inflammation such as acute cardiac inflammatory response to high blood pressure, vascular endothelial cells and fibroblasts derived IFN-γ is responsible for recruitment and activation of CD8+ T cells. This process is required to initiate and augment macrophage-mediated inflammation.Furthermore,CD8+ T cells recruit and activate macrophage rely on direct cell-cell contact, whereas in a specific antigen or TCR independent manner. CD8+ T cells possess conserved characteristics of innate immune cells, if the time frame of response and antigen nonspecidicity are considered. The innate-like property of T cells is also well illustrated in inflammation caused by infection. TangHong lab previous studies indicate that naïve CD4+ and CD8+ T cells dampen innate immune response during early phases of pathogen infection. Consistent with the situation in sterile inflammation, T cells participate in regulating innate immune response caused by infection needs cell-cell contact, yet depends on antigen specifity or TCR engagement.In conclusion,T cells posses evolutionally conserved characteristics of innate immune cells, and probably belong to the innate immune system, since its unique role in the regulation of early acute phase of inflammation.

Sensational Beats

International Invention Patent


the first inventor Prof. Yan Huimin

The Mucosal Immunity Research Group led by Prof. Yan Huimin recently filed an American invention patent (No. US 8,449,891B2), titled ***Recombinant Flagellin Protein and Preperation and Use Thereof.***
Pathogens, in particular viruses, infect human being mainly through mucosal surface. Thus, more effective vaccine for preventing pathogen invasion should be able to induce mucosal immunity besides systemic immune responses. Developing novel mucosal adjuvant for vaccine to enhance mucosal immune responses has become priority for developing new type mucosal vaccines. The mucosal immunity research group in Wuhan institute of virology, CAS has long been engaged in study of the mucosal IgA anti-viral mechanisms and the application in developing mucosal vaccines. Based on the structural and functional characteristics of bacteria flagellin, they modified flagellin molecule by recombinant DNA technology and got a series of recombinant flagellin proteins as good mucosal adjuvant candidates, which might be able to reduce possible side effects of the original flagellin molecule and retain excellent adjuvant activity. The present patent is granted for a recombinant flagellin with an unique deletion of its main immunogenicity and antigenicity regions, which might be used as a safe effective mucosal adjuvant for mucosal vaccines against various infectious pathogens such as HIV and influenza virus due to its decreased side effects and improved mucosal adjuvant activity.

Collaboration and Exchange

Recent visiting applications

Visitor	Nationality	School/Institution
Benison Macharia Mbugua	Africa	Jomo Kenyatta University of Agriculture and Technology
Richard Kipngetich Rotich	Africa	Jomo Kenyatta University of Agriculture and Technology
Sheila Cecily Ommeh	Africa	Jomo Kenyatta University of Agriculture and Technology
Wang Linfa	Australia	Australian Animal Health Laboratory, Commonwealth Scientific and Industrial Research Organization
Akihiro Kusumi	Japan	Kyoto University
Hassan Ammouneh	Syria	Atomic Energy Commission of Syria
Michael A. McVoy	USA	Virginia Commonwealth University School of Medicine