



Spotlight

New progress on treating inflammatory diseases

Inflammatory response plays significant roles in human body's resistance outside pathogen invading, repair of tissue and adjustment of stress response. In pathology state, abnormal inflammatory response relates closely to a variety of diseases. Hepatocellular carcinoma (HCC) has become a major public health problem in China, which is frequently associated with pathogen infection-induced chronic inflammation. Large numbers of innate immune cells are present in HCCs and can influence disease outcome.

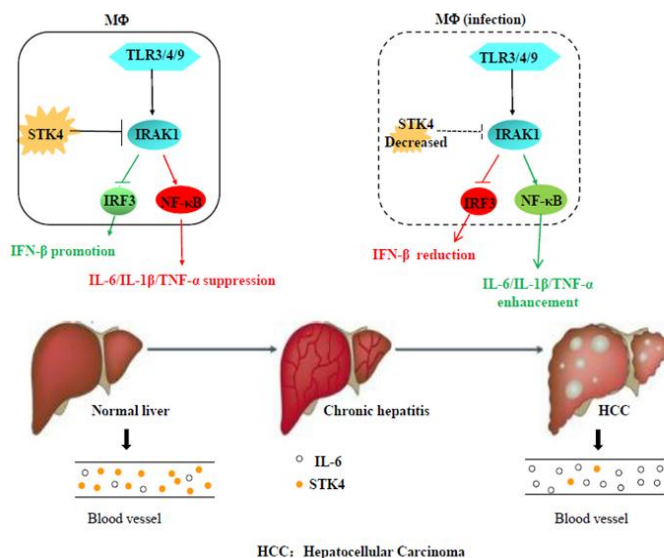
Recently, the researchers joined hands with 2 teams headed by Prof. Bin Wei in WIV and Prof. Hongyan Wang in Shanghai Institutes for Biological Sciences, and got important headways in treating inflammatory diseases and dendritic cells vaccine. First, they have demonstrated that the tumor suppressor serine/threonine-protein kinase 4 (STK4) differentially regulates TLR3/4/9-mediated inflammatory responses in macrophages and thereby is protective against chronic inflammation-associated HCC, which suggests that STK4 has potential as a diagnostic biomarker and therapeutic target for inflammation-induced HCC.

Besides, by measuring serum levels of inflammatory biomarkers along with lipid and nutritional parameters in 53 patients who suffered different degrees of particularly peripheral artery stenosis (PAS), they have found serum concentrations of vascular endothelial growth factor-c (VEGF-C) and IL-6 (Interleukin 6) were significantly increased in patients showing moderate or severe PAS. Furthermore, the number of blood monocytes from PAS patients was

significantly increased, which showed elevated adhesion to plate-coated fibrinogen. The study suggests that serum concentrations of VEGF-C and IL-6 might be used as biomarkers for diagnosis severe PAS in combination with clinical imaging examination.

Additionally, in the aspect of treating inflammatory diseases, they have identified that ADAP and SKAP55 can enhance PD-1 expression via the transcription factor NFATc1 in CD8+ CTLs (cytotoxic T lymphocytes), and proposed that targeting the unrecognized ADAP-SKAP55-NFATc1-PD-1 pathway might increase efficacy of anti-tumor immunotherapy.

STK4 regulates TLR pathway and protects against chronic inflammation-related hepatocellular carcinoma



Source:

J Clin Invest. DOI: 10.1172/JCI81203;

EMBO Molecular Medicine. DOI: 10.15252/emmm.201404578;

Journal of Inflammation. DOI: 10.1186/s12950-015-0095-y



Research Progress

Will SARS come back?

The emergence of severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome (MERS)-CoV underscores the threat of cross-species transmission events leading to outbreaks in humans.

Recently, Prof. Zhengli Shi and Xingyi Ge from WIV, in cooperation with researchers from University of North Carolina, Harvard Medical School, Bellinzona Institute of Microbiology and etc, examine the disease potential of a SARS-like virus, SHC014-CoV, which is currently circulating in Chinese horseshoe bat populations. Using the SARS-CoV reverse genetics system, the scientists generated and characterized a chimeric virus expressing the spike of bat coronavirus SHC014 in a mouse-adapted SARS-CoV backbone. The results indicate that group 2b viruses encoding the SHC014 spike in a wild-type backbone can efficiently use multiple orthologs of the SARS receptor human angiotensin converting enzyme II (ACE2), replicate efficiently in primary human airway cells and achieve in vitro titers equivalent to epidemic strains of SARS-CoV. Evaluation of available SARS-based immune-therapeutic and prophylactic modalities revealed poor efficacy; both monoclonal antibody and vaccine

approaches failed to neutralize and protect from infection with CoVs using the novel spike protein.

On the basis of these findings, they synthetically re-derived an infectious full-length SHC014 recombinant virus and demonstrate robust viral replication both in vitro and in vivo. The work suggests a potential risk of SARS-CoV re-emergence from viruses currently circulating in bat populations.



Source: Nature Medicine doi:10.1038/nm.3985
Image: medicalxpress.com

The Ebola virus antibody ELISA kit developed by WIV

Supported by the President Fund of the Chinese Academy of Sciences, the Ebola virus immunogold rapid test strips and the Ebola virus antibody ELISA kit have recently been developed in WIV. The team is led by Profs. Zhengli Shi and Bin Yan at the Center for Emerging Infectious Diseases, in collaboration with the P4 Laboratory in Lyon, France. The

results showed that both diagnostic kits can quickly and efficiently detect the antigen and antibody of Ebola virus. The Ebola virus immunogold rapid test strips can detect the virus antigen in fewer than 15 minutes. Clinical and field tests and inspection and quarantine sectors will certainly see the benefit.



Cooperation

Gates Foundation initiates plans to establish Grand Challenges China Program

Under a signed MOU which aims to strengthen cooperation in scientific and technological research on global health and development, the Bill & Melinda Gates Foundation and the National Natural Science Foundation of China (NSFC) initiates plans to establish the "Grand Challenges China Program".

Grand Challenges, created in 2003, is a collection of plans boosting innovation and cooperation to deal with the health and development issues in the global context.

As China Daily reports, the two sides will jointly select and fund research projects on major infectious diseases, reducing maternal and child mortality, translation, agriculture, food and nutrition, as well as other areas that will benefit people in need in China and beyond. The grant will be up to \$1 million and the proposals will be accepted from early 2016.

*Source: China Daily -
Gates Foundation announces plans
to establish Grand Challenges China Program*

Counselor for Science and Technology of the Embassy of France Visited WIV

On 24 Sep. 2015, Counselor for Science and Technology of the Embassy of France, Mr. Pierre Lemonde, who took office recently, visited Zhengdian Park of WIV, along with Attaché for Science and Technology of French General Consulate in Wuhan, Philippe Maurin, and International Technical Expert of the Embassy of France, Gabriel Gras.

On the Seminar, Prof. Zhiming Yuan, Director of Wuhan Branch, CAS, briefed the Sino-French collaboration on public health emergency response over the years. And then, by showing the visitors around the bio-containment level 4 laboratory (P4) in Zhengdian Park, Prof. Yuan introduced the present implementation of the cooperation project, personnel training, future operation schedule, and the exchange and cooperation on the prevention and control of emerging infectious diseases between the two sides.

Mr. Pierre Lemond highly valued the current progress and the achievements

made by the two countries in the area of the prevention and control of emerging infectious diseases. The collaborative agreement signed by them has been always put a new premium by French government, and it will continue to be promoted vigorously. After the visit and exchange, it is a shared vision that we will make further endeavor and work closely to boost the strategic cooperative partnership on the prevention and control of emerging infectious disease in more depth, so as to make greater contributions to human health and well-being.



Recent Job Openings

By contributing to the ongoing consolidation of the Center of Biosafety Big Science Facility of CAS, WIV has launched a global recruitment under the “Hundred Talent Program” of CAS. There are 2 position openings: (1) Academic deputy director; (2) Technical expert in cryo-EM.

For the further information about the job responsibilities, relevant requirements and applications, please refer to the website at http://english.whiov.cas.cn/Join_Us/Recent_Job_Openings/201511/t20151106_155315.html.

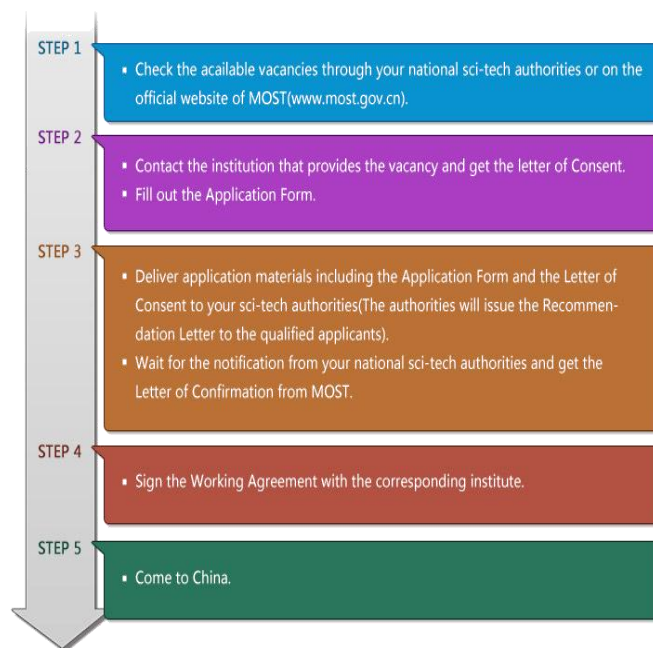
Link: International Talents Initiative

Talented Young Scientist Program

The Talented Young Scientist Program (TYSP), started by the Ministry of Science and Technology of the People’s Republic of China (MOST), supports talented young scientists, scholars and researchers from Afro-Asian countries to work in Chinese research institutes, universities or enterprises. TYSP aims to promote communication among Afro-Asian science and technology talents, nurture young science and technology leaders, and foster long-term international cooperation among research institutes, universities and enterprises in Afro-Asian countries.

For the further information about the requirements, financial support and application, please refer to the website at <http://www.tysp.org/English/>.

For the present, WIV has not yet posted vacancies on the official website of MOST. Scientists who are interested in working in WIV, please feel free to contact us.



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The Joint Program of Postdoctorates

To promote translational medicine, Wuhan Institute of Virology and the Guangzhou Women and Children's Medical Center have signed an agreement to establish a Joint Center for Precision and Translational Medicine (JPTM). JPTM will recruit postdocs together, who will be mentored by faculties from the two institutions.

The program aims to further motivate the postdocs for academic excellence, expand their career perspectives, and help

them better connect with the global context of the public health discipline.

JPTM has recruited 8 postdocs this year and will keep the pace in the following years to come.

For the further information about the financial support and application, please refer to the website at http://english.whiov.cas.cn/Join_Us/Recent_Job_Openings/201511/t20151106_155317.html.

News Express

Speakers on "Ge Hong Colloquium"

On October 11, Walter Ian Lipkin, the professor in the Center for Infection and Immunity in Mailman School of Public Health at Columbia University, paid a visit to WIV and gave an excellent talk on "Small game hunting", which focused on reasons why emerging infectious diseases occur, the development and evolution of techniques and tactics on pathogen discovery, and the current progress of molecular biotechnologies.



Dr. Dong Wang, the associate professor in Skaggs School of Pharmacy and Pharmaceutical Sciences at University of California, paid a visit to WIV on October 28. On the Colloquium, he reported his recent effort in understanding the functional interplay between the different forms of cytosine in DNA on mammalian and yeast RNA polymerase II transcription elongation.

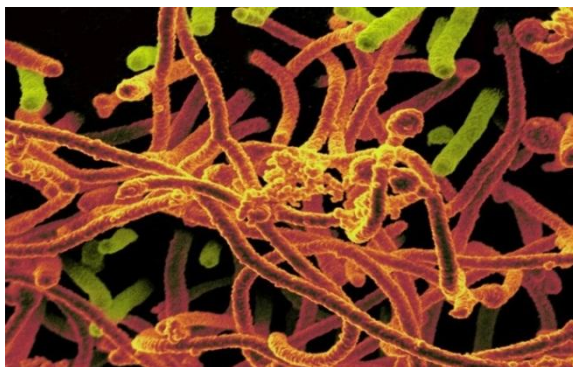


"It ain't over, even when it's over." ----The aftermath comes when Ebola leaves

At the meeting focused on fighting infectious diseases, Dr. Ian Crozier, an Ebola survivor, says he continues to experience long-term effects of the disease. In September 2014, Crozier was tested positive for Ebola when he had volunteered to treat Ebola patients in Sierra. Being treated for more than 10 weeks, he was released as the doctors could no longer detect Ebola in his blood.

However, he soon developed other symptoms, including back pain, hearing loss, tinnitus and blurry vision. "It ain't over, even when it's over," Crozier said. How Ebola can "hide" in the body without being detected by human immune system? The question still puzzles the scientists. Regardless, developing ways to

diagnose and treat these problems is in great need.

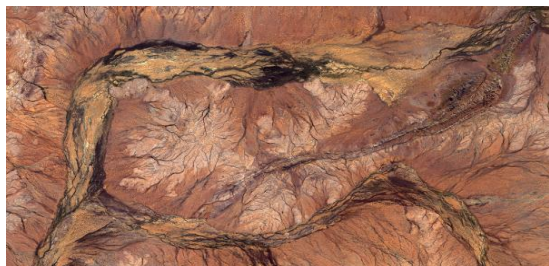


Source: liveScience - Doctor Who Survived Ebola Describes Disease's Aftermath on the Body

Image: NIAID. Researchers isolated this Ebola virus from patient blood samples collected in Mali.

Great discovery---the earliest evidence of life on Earth?

As we know, the possible traces of life that have been uncovered by geologists are as far back as 3.8 billion years. Now a new study, led by Elizabeth Bell, a geochemist at the University of California, Los Angeles, presents potential evidence of life on earth arose 300 million years before that, as Science reports.



Bell said the clues are hidden in a carbon mineral—trapped inside a single large crystal of zircon, which grows in magmas and outlasts the rocks. Zircon helps to observe the Earth's earliest history --- Hadean eon. Nevertheless, Bell and her team must test their hypothesis with additional materials. She says scientists have to work together to discover more Hadean carbon in zircons and see if it has potentially biological origins as well.

Source: Science DOI: 10.1126/science.aad4732

Image: by Robert Simmon, based on data from the University of Maryland's global land cover facility

Follow Your Gut. It's never wrong

"The enormous implications of this micro-scale relationship, implicated in conditions as diverse as obesity, anxiety, arthritis, autism, and depression, are what Rob Knight explores in the deeply fascinating Follow Your Gut."

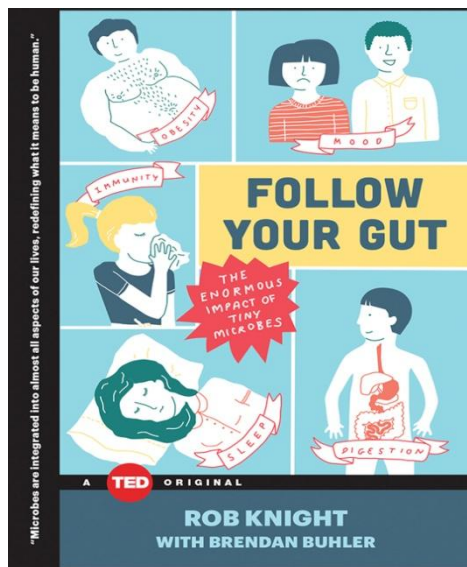
— Maria Papova, Brain Pickings

Allergies, asthma, obesity, acne: these are just a few of the conditions that may be caused—and someday cured—by the microscopic life inside us. The key is to understand how this groundbreaking science influences your health, mood and more. Pioneering scientist Rob Knight from the University of Boulder, Colorado, one of the main researchers involved in the Human Microbiome Project, and award-winning science journalist Brendan Buhler try explaining with humor and witty metaphors how gut microbiota affects many aspects of human's everyday life.

The human gut is host to trillions of microbes, and evidence shows that small changes in these microbes present (altered by antibiotics, diet, geographic region, and so on) may affect weight, likelihood of disease, and even psychological factors like risk-taking behavior. The evidence for their influence is astonishing. Rob Knight's work demonstrates the startling connection between the presence of certain harmless bacteria and the health benefits we all seek for ourselves and our children.

In *Follow Your Gut*, Knight pairs with Brendan Buhler to explore the previously unseen world inside our bodies. With a practical eye toward

deeper knowledge and better decisions, they lead a detailed tour of our micro-biome, as well as an exploration of the known effects of antibiotics, probiotics, diet choices, birth method, and access to livestock on our children's lifelong health. Ultimately, this pioneering book explains how to learn about your own micro-biome and take steps toward understanding and improving your health, using the latest research as a guide. Undoubtedly, we have much to learn about ourselves as individual microbial ecosystems.



Source: Cell doi:10.1016/j.cell.2015.10.053
Book: Rob Knight & Brendan Buhler. Follow Your Gut [M]. New York: Simon & Schuster/TED, 2015.