

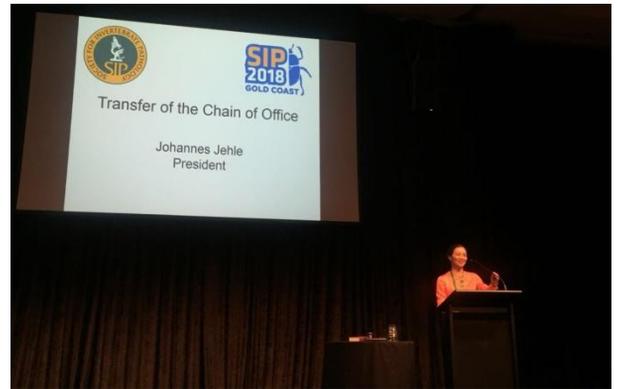


## Spotlight

### Prof. HU Zhihong is elected as President of the Society for Invertebrate Pathology

Recently, the 51st Annual Meeting of the Society for Invertebrate Pathology (SIP) was held on the Gold Coast of Australia. Prof. HU Zhihong from Wuhan Institute of Virology, Chinese Academy of Sciences has been elected as the President of SIP from 2018 to 2020. For the first time in 50 years, scientist outside the European and American countries has served as the president of the organization.

SIP has a long history, which is a multidisciplinary international academic organization founded in 1967 by Professor E. A. Steinhaus from University of California. Now SIP sets up 7 divisions: Bacteria, DBI, Fungi, Microbial Control, Microsporidia, Nematodes and Virus, and has nearly 500 members from more than 50 countries. SIP aims to enhance the scientific research level of invertebrate pathology and related fields through academic discussions, publications of research papers and reports, improve the education and training of invertebrate pathology researchers, and promote international exchanges and cooperation. It plays an important role in promoting China's research and development of invertebrate pathology, microbial control and research and application on biopesticide, as well as academic exchanges with foreign first-class laboratories.



Prof. Hu Zhihong took over the inaugural speech as the SIP President

Professor HU Zhihong has been engaged in research of insect viruses for a long time, and has made important achievements in studies on the molecular mechanism of baculovirus infection, genetic improvement of viral biological pesticides, and synthesis of baculovirus. Professor HU previously served as the Council Member and Vice President of SIP. This election is not only an affirmation of her outstanding scientific achievements from the international academic community, but also a testament to the rising international influence of China in the field of invertebrate pathology and biological control.

## Research Progress

## A recombinant protein could attenuate *S. aureus* virulence and enhance host immune defenses via multiple manners

New anti-infective approaches are much needed to control multi-drug-resistant (MDR) pathogens, such as methicillin-resistant *Staphylococcus aureus* (MRSA).

In a recent study, the research group led by Prof. WEI Hongping in Wuhan Institute of Virology of the Chinese Academy of Sciences found for the first time that a recombinant protein derived from the cell wall binding domain (CBD) of the bacteriophage lysin PlyV12, designated as V12CBD, could attenuate *S. aureus* virulence and enhance host immune defenses via multiple manners.

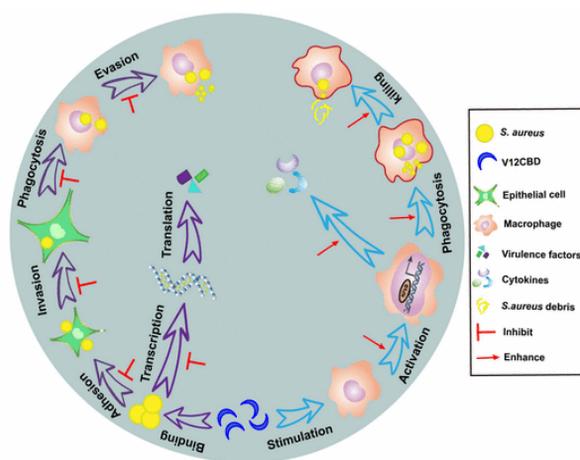
After binding with V12CBD, *S. aureus* became less invasive to epithelial cells and more susceptible to macrophage killing. The expressions of multiple important virulence genes of *S. aureus* were reduced 2.4- to 23.4-fold as response to V12CBD. More significantly, V12CBD could activate macrophages through NF- $\kappa$ B pathway and enhance phagocytosis against *S. aureus*. As a result, good protections of the mice from MRSA infections were achieved in therapeutic and prophylactic models.

These unique functions of V12CBD would render it a novel alternative molecule to control MDRS. aureus infections.

The results have been published in the EMBO Journal entitled "Staphylococcus aureus virulence attenuation and immune clearance mediated by a phage lysin-derived protein".

This work was supported by the National Natural Science Foundation of China and Chinese Academy of Sciences.

Link: <http://emboj.embopress.org/content/early/2018/07/23/embj.201798045.full>



## Scientists found that ClyR could be a promising agent or additive for the prevention and treatment of dental caries

Dental caries is a common disease caused by oral bacteria. *Streptococcus mutans* and *Streptococcus sobrinus* are the primary cariogenic microbes that often survive as biofilms on teeth.

In a recent study, we the research group led by Prof. WEI Hongping in Wuhan Institute of Virology of the Chinese Academy of Sciences evaluated the activity of ClyR, a well-known chimeric lysin with extended

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streptococcal host range, against common Gram-positive oral microbes and its anticaries efficacy in rat models. ClyR demonstrated high lytic activity against *S. mutans* MT8148 and *S. sobrinus* ATCC6715, with minor activity against *Streptococcus sanguinis*, *Streptococcus oralis*, and *Streptococcus salivarius*, which are considered as harmless commensal oral bacteria. Confocal laser scanning microscopy showed that the number of viable cells in 72-h aged *S. mutans* and *S. sobrinus* biofilms are significantly ( $p < 0.05$ ) decreased after treatment with 50  $\mu\text{g}/\text{mL}$  ClyR for 5 min.

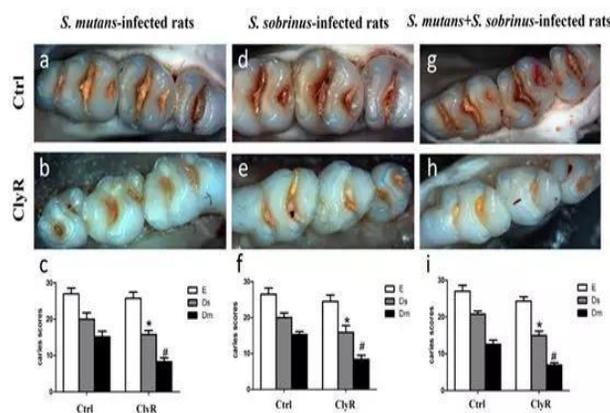
Furthermore, continuous administration of ClyR for 40 days (5  $\mu\text{g}/\text{day}$ ) significantly ( $p < 0.05$ ) reduced the severity of caries in rat models infected with a single or a mixed bacteria of *S. mutans* and *S. sobrinus*.

Therefore, ClyR could be a promising agent or additive for the prevention and treatment of dental caries.

The results have been published in viruses entitled "Activity of the Chimeric Lysin ClyR against Common Gram-Positive Oral Microbes and Its Anticaries Efficacy in Rat Models".

This work was supported by the National Natural Science Foundation of China and Chinese Academy of Sciences.

Link: <https://www.mdpi.com/1999-4915/10/7/380>



## Cooperation

# The inaugural meeting of the Science and Technology Steering Committee of the Wuhan P4 Laboratory was held

On the morning of September 29, the inaugural meeting of the Science and Technology Steering Committee of the Wuhan National Biosafety Laboratory of the Chinese Academy of Sciences (hereinafter referred to as "Wuhan P4 Laboratory") was held. ZHANG Tao, the Vice President of the Chinese Academy of Sciences (CAS) attended the meeting. The meeting was hosted by Academician George F. Gao, the Director of the Science and Technology Steering Committee of Wuhan P4 Laboratory and

Director of the Chinese Center for Disease Control and Prevention.

At the meeting, ZHANG Tao issued the appointment certificates to the experts of the Steering Committee. Then the experts jointly examined the charter of the Steering Committee, and listened to the Wuhan P4 laboratory operation and research layout progress report. The participants also conducted in-depth exchanges and discussions on laboratory's qualifications in

## Cooperation



pathogen preservation, scientific and technological cooperation mechanisms, and talent introduction, and clarified the Wuhan P4 laboratory's support capabilities for biosafety platforms, viral resource culture capacity, and national biosafety construction services.

The experts expressed their affirmation for the contribution of Wuhan P4 Laboratory to China's biosafety, human health and public health fields, and pointed out that the laboratory should play as a good high-level biosafety platform in the positioning of co-construction and common management. The laboratory shall further strengthen management, train high-level biosafety experimenters, conduct more in-depth and extensive international cooperation and scientific research, and carry a national-level mission.

ZHANG Tao thanked the relevant state and local authorities and the participating experts for their support of Wuhan P4 laboratory. He pointed out that as the country's first high-level biosafety laboratory built in accordance with international standards, Wuhan P4 laboratory is not only an important part of the strategic deployment by CAS, but also a institution that jointly built with the National Health Commission of China

and the Hubei Provincial People's Government. As a hardware facility and conditional platform for researching and utilizing highly pathogenic pathogens, Wuhan P4 Laboratory is not only a laboratory of the Chinese Academy of Sciences, but also a national laboratory. We must continue to uphold the concept of open sharing, further strengthen cooperation with domestic and foreign scientific research and health institutions, and constantly absorb and bring together outstanding scientific research staff at home and abroad to produce more and more important outstanding results. In the future scientific research activities, we will further enhance the sense of urgency and responsibility, adhere to demand orientation, problem orientation, goal orientation, and consolidate the direction of scientific research, so that the laboratory can give full play to the leading and pivotal role of large scientific facilities. For the national biosafety, the laboratory will make greater contributions to the cause of human health.

WU Peixin, the Deputy Director of the Science and Technology Department of the National Health Commission of China, and GE Lin, the Deputy Director of Department of Science and Technology of Hubei Province, and the representatives from CAS attended the meeting.



## Science Tips

## A deadly pig disease raging in China is bound to spread to other Asian countries, experts warn

**A**frican swine fever (ASF), a deadly virus in pigs and wild boar, continues to spread in China and will almost certainly wreak havoc in other countries in Asia soon. That's the somber conclusion from a meeting of animal health experts organized by the United Nations's Food and Agriculture Organization (FAO) in Bangkok late last week. "It's no longer 'if' [spread beyond China] will happen but when, and what we can do collaboratively to prevent and minimize the damage," FAO Chief Veterinary Officer Juan Lubroth said in a statement issued on Friday, at the end of the 3-day meeting. Veterinary authorities from 12 countries agreed to form a new network to share information and work jointly to control the spread of the disease.

The virus that causes ASF doesn't infect humans, but the most virulent strains are nearly universally fatal for pigs. There is no vaccine and no cure, so controlling the spread of the disease requires destroying all animals on infected farms. The appearance of the virus in China in August—and its inevitable spread—threatens devastating economic losses for farmers and shortages of a vital source of protein for citizens of developing countries, particularly in East and Southeast Asia.



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The virus is on the move in Eurasia and Eastern Europe as well. Bulgaria reported its first outbreak to the World Organisation for Animal Health in Paris on 31 August; the virus has also been found in Georgia, Russia, Poland, the Czech Republic, Romania, and Moldova. In Europe, the virus is appearing primarily in backyard pens and its spread likely involves wild boars. (The disease can also be transmitted by ticks.) In China, so far, the virus has appeared at larger commercial operations. If it spreads to traditional farms, it might also jump to wild boars and become endemic in the countryside, says François Roger, an animal epidemiologist at the Agricultural Research Center for International Development in Montpellier, France. The precise risk is unclear as little is known about wild boar populations in China.

In an unrelated development, another pig disease has resurfaced in Japan, where the agriculture ministry has confirmed the country's first outbreak of classical swine fever in 26 years, on a farm in Gifu prefecture in central Japan. Although they have similar names, the viruses carrying ASF and classical swine fever are unrelated. The highly virulent ASF can kill entire herds, whereas the classical swine fever virus is less virulent and less dangerous for older pigs than for piglets; it can also be prevented using vaccines. After a campaign to eliminate the virus, Japan was declared free of classical swine fever in 2007.

Source: ScienceNews (<http://www.sciencemag.org/news/2018/09/deadly-pig-disease-raging-china-bound-spread-other-asian-countries-experts-warn>)



## WIV conducted a one-day social practice for foreign graduates

According to the requirements of the graduate program of the National University of Science and Technology, and in order to enrich the extracurricular life of students studying in China, improve the overall quality of students' psychology and body, and to strengthen exchanges between students and enhance friendship, on September 27, Wuhan Institute of Virology of Chinese Academy of Sciences conducted a one-day social practice for foreign graduates.

With the continuous advancement of the "Belt and Road" initiative, the international exchanges and cooperation of Wuhan Institute of Virology have become more frequent and deeper, which has established a bridge for the foreign students along the "Belt and Road", and expanded the way of talent training and output of the Institute. In 2018, the total number of foreign students studying in Wuhan Institute of Virology has increased by 80% compared with the previous year. The

number of foreign students along the "Belt and Road" also continued to grow, contributing to the international academic development in our institute.

Wuhan Institute of Virology has been recruiting international students since 2013. Currently, there are 20 international students from South Asia and Africa. So far, 2 doctors and 3 masters have been cultivated in our institute.



## Upcoming event – The 8<sup>th</sup> International Symposium on Emerging Viral Diseases

The 8th International Symposium on Emerging Viral Diseases will be held on October 20-22, 2018 in Wuhan, China.

- This symposium will focus on four aspects:
- Emerging Viral Pathogen
  - Virus-Host Interactions

- Antiviral Immunity
- Arbovirus

The registration website:  
<http://www.whiov.ac.cn/isevd/>

