



Spotlight

WIV Has Joined the EVAg Project

Recently, Wuhan Institute of Virology (WIV), Chinese Academy of Sciences (CAS) has officially joined the European Virus Archive goes global (EVAg) project, a part of the European Horizon 2020 Research Project, after signing the consortium agreement.

In 2009, the European Virus Archive (EVA) project started. It is a project funded by the European Union Seventh Framework Programme (FP7). The overall objective was to create and mobilize a European network of high calibre centres with the appropriate expertise, to collect, amplify, characterize, standardize, authenticate, distribute and track mammalian and other exotic viruses. The EVA project was very successful that the EVA web-based catalogue contains 1364 well-characterized viruses and about 2000 products to the scientific community. The current project EVAg (2015-2019) is aimed at the largest global virus collection network. Now it includes an international group of 26 laboratories including 17 EU member state institutions and 9 non-EU institutions. EVAg objectives will meet the needs of scientists worldwide by generating a carefully authenticated animal virus collection that is larger than any existing repository, and readily available to all laboratories that meet approved ethical, safety and security standards.

As a core partner under this project, WIV is the only institute specializes in virology, viral pathology and virus technology, among 19 other biological and biomedical research institutes in

CAS. WIV contains a virus collection center--China Center for General Viruses Culture Collection (CCGVCC), which was established by the Chinese government in 1979 as a professional center for virus collection. It was registered as a member of World Federation for Culture Collections (WFCC) in 1989 and admitted as one of the six national culture collection centers of pathogenic microorganism and virus strain with human-to-human transmission in 2013 by the National Health and Family Planning Commission of China.

Prof. Zhihong Hu participates in the EVAg project as the leading scientist of EVAg in WIV. She is also one of the leaders of the Workgroups for Advancement Validation and Exchanges (WAVEs) in EVAg that in charge of Viruses for Biotechnology (WAVE 9). Currently Prof. Hu is the Director of Center for Bacteria and Virus Resources and Application, the Director of CCGVCC, and the group leader of the research group of Systems Virology in WIV.



Link:
EVAg Website - <http://global.european-virus-archive.com/>

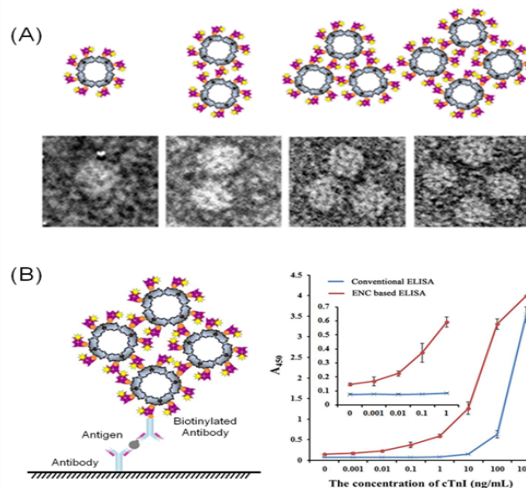


New Progress on Self-Assembly of Ferritin Nanoparticles

The self-assembly of nanoparticles into larger superstructures is a powerful strategy to develop novel functional nanomaterials, as these superstructures display collective properties that are different to those displayed by individual nanoparticles or bulk samples. However, there are increasing bottlenecks in terms of size control and multifunctionalization of nanoparticle assemblies.

Recently, under the collaboration with scientists from Institute of Biophysics, CAS, Henan University, Huazhong Agriculture University and Kaifeng Central Hospital, some research fellows under the Center for Molecular Microbiology and Nanobiology in WIV, developed a self-assembly strategy for construction of multifunctional nanoparticle assemblies of tunable size, through rational regulation of the number of self-assembling interaction sites on each nanoparticle. As proof-of-principle, a size-controlled enzyme nanocomposite (ENC) was constructed by self-assembly of streptavidin-labeled horseradish peroxidase (SA-HRP) and autobiotinylated ferritin nanoparticles (bFNP). Their ENC integrates a large number of enzyme molecules, together with a streptavidin-coated surface, allowing for a drastic increase in enzymatic signal when the SA is bound to a biotinylated target molecule.

As result, a 10000-fold increase in



sensitivity over conventional enzyme-linked immunosorbent assays (ELISA) methods was achieved in a cardiac troponin immunoassay. Their method should provide a feasible approach for constructing elaborate multifunctional superstructures of tunable size useful for a broad range of biomedical applications.

Source: ACS Nano doi:10.1021/acs.nano.5b03607

Real-Time Tracking of the Fate of Protein Nanomedicine In Vivo

Protein nanocages (PNCs) have been recognized as a promising platform for nanomedicine innovation. Real-time in vivo tracking of PNCs can provide critically important information for the development of PNC-based diagnostics and therapeutics.

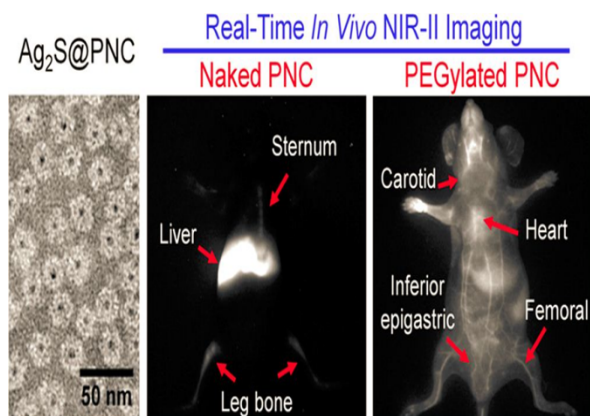
On the basis of previous study and by cooperating with the team led by Prof.

Qiangbin Wang in Suzhou Institute of Nano-Tech and Nano-Bionics, CAS, the research group led by Prof. Feng Li in WIV, demonstrated a general strategy for monitoring the behaviors of PNCs in vivo by encapsulating a Ag₂S quantum dot (QD) with fluorescence in the second near-infrared window (NIR-II, 1000–1700 nm)

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inside the PNC, using simian virus 40 (SV40) PNC (PNCSV40) as a model. Benefiting from the high spatiotemporal resolution and deep tissue penetration of NIR-II fluorescence imaging, the dynamic distribution of the

PNCSV40 in living mice was tracked in real time with high fidelity, and adopting the PEGylation strategy, surface chemistry-dependent *in vivo* behaviors of PNCSV40 were clearly revealed.



This study represents the first evidence of real-time tracking of the intrinsic behaviors of PNCs *in vivo* without interference in PNC-host interactions by encapsulating nanoprobe inside. The as-described imaging strategy will facilitate the study of interactions between exogenously introduced PNCs and host body and prompt the development of future protein-based drugs, sensors, and high-efficacy targeted delivery systems.

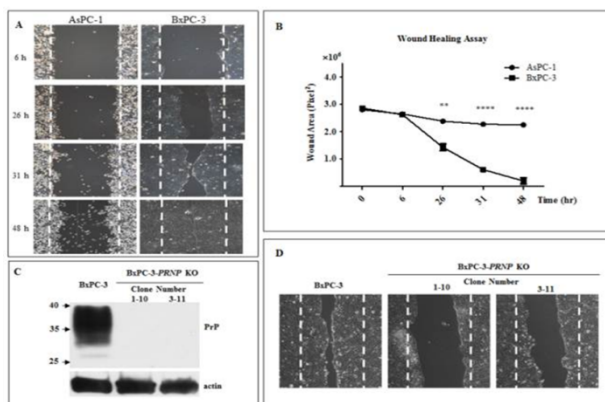
Source: ACS Nano 10.1021/acsnano.5b05503

GPI Anchor Modification Machinery Deficiency Causes Accumulation of Pro-PrP in BxPC-3

On Dec 18, 2015, the research group led by Prof. Chaoyang Li in WIV, had reported the identification of another PDAC cell line, AsPC-1, which expresses a matured, GPI-anchored PrP. Comparison of the 24 genes involved in the GPI anchor modification pathway between AsPC-1 and BxPC-3 revealed 15 of the 24 genes, including PGAP1 and PIG-F were down regulated in the latter cells. They also identified 6 missense mutations in DPM2, PIG-C, PIG-N and PIG-P alongside 8 silent mutations. When BxPC-3 cells were fused with Chinese Hamster Ovary (CHO) cells, which lack endogenous PrP, pro-PrP was successfully converted into matured, GPI-anchored PrP. Expression of the individual gene, such as PGAP1, PIG-F, or PIG-C into BxPC-3 cells does not result in PI-PLC sensitivity of PrP. However, when PIG-F but not PIG-P is expressed in PGAP1 expressing BxPC-3 cells, PrP on the cells surface becomes PI-PLC sensitive. Thus, low expression of PIG-F and

PGAP1 are the major factors contributing to the accumulation of pro-PrP. More importantly, BxPC-3 cells expressing GPI anchored PrP migrate much slower than BxPC-3 cells bearing pro-PrP.

Collectively, these results show that multiple gene irregularity in BxPC-3 cells is responsible for the formation of pro-PrP, and binding of pro-PrP to FLNA contributes to enhanced tumor cell motility.



Source: The Journal of Biological Chemistry
doi:10.1074/jbc.M115.705830



MoHS and WIV Face Golden Opportunity to Accelerate Cooperation

Emerging and re-emerging infections are a serious threat to humanity and human development, especially in developing countries where poor health systems and structures exist. With the increase in international trade and travel, the spread of deadly human and animal diseases across borders has become a reality, and hence the need for support and international collaboration. The recent unprecedented Ebola outbreak in West Africa (Sierra Leone, Guinea and Liberia) and its toll on life, property and development is an eye-opener to the world regarding support to develop better health systems in resource-limited countries as an offensive-defensive tool for developed countries.

On Dec 23 to 24, 2015, Dr. Kamara, the manager of National Lab Services Program in Ministry of Health & Sanitation (MoHS), Sierra Leone, visited the P4 laboratory in WIV, and introduced the operating condition of the national lab of MoHS in Sierra Leone before the outbreak of Ebola virus, the kind support from other



countries including China, the U.S., Canada and the UK for fighting the disease in Sierra Leone and the later problems need to be countered. According to him, international collaboration and cooperation in Ebola laboratory services delivery in Sierra Leone helped to save lives due to early diagnosis and hence early patient management, whilst building local capacity for national ownership. It is convinced that MoHS and WIV have common interests in doing studies on Ebola virus and the two parties are facing golden opportunity to accelerate cooperation. In future, MoHS and WIV will strengthen the scientific communication with each other.

Study in WIV

One. 2016 CAS-TWAS President's Fellowship Programme for Doctoral Candidates

According to an agreement between CAS and The World Academy of Sciences (TWAS) for the advancement of science in developing countries, up to 200 students/scholars from all over the world will be sponsored to study in China for doctoral degrees for up to 4 years.

Under this Programme, students who are non-Chinese citizens have the opportunity to pursue doctoral degrees at the

University of Chinese Academy of Sciences (UCAS), the University of Science and Technology of China (USTC) or Institutes of CAS around China.

For the further information about the general conditions, financial support and application, please refer to the website at http://english.whiov.cas.cn/Join_Us/Recent_Job_Openings/201512/t20151224_157797.html.



Two. 2016 Chinese Government Scholarship

The Chinese government has set up a series of scholarship programs to sponsor international students, teachers and scholars to study and conduct research in Chinese universities. China Scholarship Council, entrusted by the Ministry of Education of People's Republic of China, is responsible for the enrollment and administration of Chinese Government Scholarship programs.

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

The Chinese University Program is one of the Chinese Government Scholarship programs. It is a full scholarship to support Chinese universities to enroll outstanding international students for graduate studies in China. Eligible applicants may submit their applications for the scholarship via UCAS.

For the further information about the scholarship coverage, duration and application, please refer to the website at http://english.whiovcas.cn/Join_Us/Recent_Job_Openings/201512/t20151224_157798.html.

Three. 2016 UCAS Scholarship for International Students

UCAS has set up the UCAS Scholarship for International Students to sponsor young talents all over the world to pursue Master's or Doctoral degree, attend courses or conduct research at UCAS campus/CAS institutes. The Scholarship

also encourages international graduate students currently studying at foreign universities to pay academic visits to UCAS where they study on joint programs. The Scholarship consists of both a full scholarship and a partial scholarship. The full scholarship provides tuition waiver, monthly stipend, basic accommodation and medical insurance; while the partial scholarship covers some items of the Full. Since 2013, the scholarship has been majorly sponsoring Master's degree candidates. 29.4% of the new international students enrolled in 2015 by UCAS are sponsored by the Scholarship.

For the further information about the scholarship coverage, duration and application, please refer to the website at http://english.whiovcas.cn/Join_Us/Recent_Job_Openings/201512/t20151224_157800.html.



Upcoming Events: Nature Conference on Viral Infection and Immune response

The viral diseases have been a threat to human health, and the relevant studies have become one of the hotspots of life science. Infection and immunity are the fundamentals to understand both acute and chronic viral diseases. To understand viral immunopathogenesis is the key to counteract viral infection. Nature Conference on Viral Infection and Immune Response, bringing together leading international scientists to explore emerging themes in viral infections and immune dysregulation, and providing promising venues for immune interventions, will be held on Oct 21-23, 2016 in Wuhan, China.

The conference will focus on 6 topics:

epidemiology of emerging viral disease, persistent viral infection and immune dysregulation, viral pathogenesis, immune intervention and prevention of disease, innate antiviral immunity and induction of systemic adaptive immunity, aiming at the development of studies on viral infection and immune response, providing guidance on the immune intervention and removing barriers to international research collaboration.

Warmly welcome scientists and students at home and abroad to attend the conference! For the further information, please refer to the website at <http://viir2016.csp.escience.cn>.

Hosting Organizations



nature
microbiology



An Article in Memory of Prof. H. Zanyin Gaw

Recently, an article in memory of Prof. H. Zanyin Gaw written by Dr. Huan Liu, Han Zhang and Doudou Chen in WIV has been published on Protein & Cell, which is an international well-known journal. "Prof. Gaw has left a valuable and generous spiritual fortune for us. His entrepreneurship of 'Pioneering the World' will continue to lead youth to march towards the advancement of science, the lessons from Prof. Gaw should be everlastingly cherished and never forgotten," it said.

Prof. Gaw was one of the founders of

virology in China. He established the first virology research institute, the first microbiology major and the first virology major of China. In 1958, his research on the silkworm pus virus tissue culture represented a breakthrough of invertebrate tissue culture and insect virus research. His book Theory and Applied Research on Insect Viruses was received to worldwide widespread acclaim. In 1980, he was elected as a member of the Academic Divisions of CAS. Throughout his 56 years of research and education, he made tremendous contributions to the progress of Chinese microbiology and virology.



The Heart of Loving Beauty, Virus Also Has It

Chinese Electron Microscopy Society held the 2015 National Electron Microscopy Academic Conference in Chengdu, Sichuan. Hundreds of representatives in field of microscopy had attended the conference, as it provides the biggest national platform for sharing knowledge, exchange of views and experience, and discussion on all aspects of microscopy. This conference in 2015 covered technologies such as scanning probe microscopy, confocal laser microscopy and in-situ electron microscopy, and focused on achievements of basic and applied research in fields of physics, chemistry, geography, life sciences and so on.

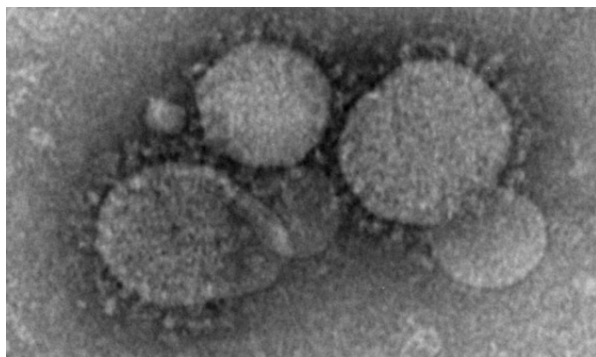
In order to honor the scientists, technologists and graduate students who have made contributions to the cause of electron microscopy in our country, the



conference set up some awards through public appraisal. Bichao Xu from the Center for Instrumental Analysis and Metrology in WIV won second prize of the Sixth Photography Competition on Electron Microscopy in China. In the award-winning photograph named “Eriobotrya deflexa”, the author compares the conidiophore of botrytis cinerea to the yellow loquats, and the hypha to the branch, which are very vivid and beautiful.

Scientists Unveiled a New Species of MERS-CoV

Outbreaks of Middle East respiratory syndrome (MERS) raise questions about the prevalence and evolution of the MERS coronavirus (CoV) in its animal reservoir. The surveillance in Saudi Arabia in 2014 and 2015, by scientists from University of Hong Kong, University of Sydney and etc., showed that



viruses of the MERS-CoV species and a human CoV 229E-related lineage co-circulated at high prevalence, with frequent co-infections in the upper respiratory tract of dromedary camels.

Including a betacoronavirus 1 species, they found that dromedary camels share three CoV species with humans. Several MERS-CoV lineages were present in camels, including a recombinant lineage that has been dominant since December 2014 and that subsequently led to the human outbreaks in 2015. Camels therefore serve as an important reservoir for the maintenance and diversification of the MERS-CoVs and are the source of human infections with this virus.

Source: Science doi:10.1126/science.aac8608
Image: Science