KEYNOTE SPEAKER

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Development of a chemically modified protein-based microbicides for prevention of HIV sexual transmission and treatment of HPV infection

BIOGRAPHY-

Dr. Shibo Jiang was educated in China and received his postdoctoral training in the Rockefeller University. Since 1990, he has worked in the Lindsley F. Kimball Research Institute of the New York Blood Center as Assistant Member, Associate Member, Member, and Co-head of Viral Immunology Laboratory. In 2010, he, as a "One-Thousand-Talents" scholar, joined the Fudan University and worked as a professor at Shanghai Medical College, China. As a PI, he has received 8 grants (about 20 millions USD) from NIH of the United States and 8 grants (about 20 millions RMB) from Chinese foundations, published more than 360 SCI papers in high profile journals (e.g., Nature, Nature Medicine, Nature Communication, Nature Review Microbiology, Lancet, Cell, JEM, PNAS) with >11,000 citations. He has applied for 26 US patents (18 of them were issued), and 17 Chinese and PCT patents (5 of them were issued), and given more than 180 oral presentations at international conferences, academic institutions and pharmaceutical companies in more than 30 countries. Dr. Jiang has served as an Editorial Consultant for The Lancet, Scientific Editor of PloS ONE and Editorial Board Member for Retrovirology, Biochim Biophys Acta, Microbes and Infection, Emerging Microbes and Infection and The Open AIDS Journal, and ad hoc referee for more than 60 international journals. He previously held guest professorships in several top Chinese universities and institutions, including Fudan University, Wuhan University, the First Military Medical University, the Fourth Military Medical University, and Chinese Academy of Military Medical Sciences.

ABSTRACT-

HIV transmission through sexual contact has accounted for more than 90% of the new HIV infection in China in recent years and development of effective and safe microbicides is urgently needed to prevent sexual transmission of HIV. We previously have shown that a 3-Hydroxyphthalic Anhydride-modified bovine ?-Lactoglobulin (HP-LG, also known as JB01) and chicken ovalbumin (HP-OVA) are highly effective in inhibiting infection by a broad-spectrum of HIV and SIV (Nat. Med., 2:230,1996; Antimicrob. Agents Chemother. 54:1700, 2010). Combinations of HP-OVA with Antiretroviral drug-based microbicides displayed synergistic and complementary effects against HIV-1 infection (JAIDS. 56:384, 2011). Because of the high stability, solubility, safety and abundance of JB01 protein, we are now developing it in a slow-release gel formulation as an effective, safe, and inexpensive microbicide for prevention of HIV sexual transmission in China and other countries. Interestingly, we found that JB01 protein also exhibited highly potent inhibitory activity against infection by HPV, including

the high-risk types HPV16 and HPV18 and low-risk type HPV6. Its anti-HPV activity was correlated with the percentage of modified Lysine and Arginine residues and the increased net-negative charges in JB01, suggesting that JB01 protein blocks HPV entry, possibly through its interaction with the positively charged proteins, such as L1 and L2 proteins on the surface of HPV (Microb. Infect. 15:506, 2013). The results from a randomized open-label clinical trial of a JB01 biological dressing (JB01-BD) administered intravaginally demonstrated that there were no serious adverse events and the deteriorated vaginal micro-environment because of the HPV infection became normalized after the treatment (J. Med. Virol. 88:1098, 2016). About 60.5% of HPV-positive women in the treatment group became HPV-negative compared with 13.5%of women in the non-treatment group becoming HPV-negative ($P < 0.001$) (Microbes Infect. 18:148-52, 2015). These data suggest that JB01-BD is a safe and effective topical biological agent for the treatment of cervical HPV infection and reduction of morbidity of cervical cancer caused by the high-risk HPV infection. It has been approved by China Food and Drug Administration (CFDA) for clinical use to treat women with cervical infection of HPV.