Fang He et al., Immunol Case Rep 2019, Volume 3

EFFECTIVE *IN VIVO* THERAPEUTIC IGG ANTIBODY AGAINST VP3 OF ENTEROVIRUS 71 WITH RECEPTOR-COMPETING ACTIVITY

Fang He[1,4], Qiang Jia[1], Qingyong Ng[1], Wenjie Chin[2], Tao Meng[1], Vincent Tak Kwong Chow[3], Cheng-I Wang[2] and **Jimmy Kwang[1,3]**
[1]Temasek Life Sciences Laboratory, Republic of Singapore
[2]Agency for Science Technology and Research, Singapore
[3]National University of Singapore, Republic of Singapore
[4]Zhejiang University, China

Passive immunization is an effective option for treatment against hand, foot and mouth disease caused by EV71, especially with cross-neutralizing IgG monoclonal antibodies. In this study, an EV71-specific IgG2a antibody designated 5H7 was identified and characterized. 5H7 efficiently neutralizes the major EV71 genogroups (A, B4, C2 and C4). The conformational epitope of 5H7 was mapped to the highly conserved amino acid position 74 on VP3 capsid protein using escape mutants. Neutralization with 5H7 is mediated by the inhibition of viral attachment, as revealed by virus-binding and post-attachment assays. In a competitive pull-down assay with SCARB2, 5H7 blocks the receptor-binding site on EV71 for virus neutralization. Passive immunization of chimeric 5H7 protected 100% of two-week-old AG129 mice from lethal challenge with an EV71 B4 strain for both prophylactic and therapeutic treatments. In contrast, 10D3, a previously reported neutralizing antibody that takes effect after virus attachment, could only confer prophylactic protection. These results indicate that efficient interruption of viral attachment is critical for effective therapeutic activity with 5H7. This report documents a novel universal neutralizing IgG antibody for EV71 therapeutics and reveals the underlying mechanism.

BIOGRAPHY

Fang He is from Institute of Preventive Veterinary Medicine, College of Animal Sciences of Zhejiang University, China. Her research mainly focuses on vaccine and antibody development against multiple human and animal infectious diseases, including influenza, HFMD and major swine diseases. She has published over 40 research articles in SCI top journals mostly as first or corresponding author in Journal of Virology and Journal of Proceedings of the National Academy of Sciences of the United States of America.

hefangzj@zju.edu.cn