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China isolates potent neutralizing Abs against SARS-CoV-2

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The potent neutralizing antibody could be used to develop drugs for both therapeutic intervention and prophylactic protection against SARS-CoV-2.

A team of researcher at Beijing Advanced Innovation Center for Genomics (ICG) at Peking University (PKU), China under the leadership of Director Sunney Xie has identified multiple highly potent neutralizing antibodies against the novel coronavirus SARS-CoV-2, from convalescent plasma by high-throughput single-cell sequencing.

Neutralizing antibodies generated by the human immune system can effectively prevent cells from viral infection. The neutralizing antibody isolated from the blood of 60 recovered patients provided a potential cure for COVID-19 in animal studies.

This study has been published online in *Cell*, titled "Potent neutralizing antibodies against SARS-CoV-2 identified by high-throughput single-cell sequencing of convalescent patients' B cells".

Antibody therapies have been adopted to successfully treat viruses like AIDS, Ebola, and MERS. However, the development of neutralizing antibodies suitable for clinical use takes months or even years and thus time-consuming. The active component of plasma therapy is the target-specific neutralizing antibody. Though plasma therapy has exhibited certain efficacy, it's limited by convalescent plasma supply.

By using their expertise in single-cell genomics, Sunney Xie's team at ICG, PKU in collaboration with researchers of Beijing YouAn Hospital collected blood samples from over 60 convalescent patients, among which 14 highly potent neutralizing antibodies were selected from 8,558 antigen-binding IgG1+ clonotypes. Their most potent antibody, BD-368-2, exhibited an IC50 of 8pM and 100pM against pseudotyped and authentic SARS-CoV-2. Experiments on the authentic virus were completed in the P3 laboratory of the Academy of Military Medical Sciences.

The *in vivo* antiviral experiment of neutralizing antibodies has recently been completed, using hACE2 transgenic mice model developed by Dr. Chuan Qin's lab at ILAS. The results showed that BD-368-2 antibody could provide strong therapeutic efficacy and prophylactic protection against SARS-CoV-2: When the BD-368-2 antibody was injected into infected mice, virus

load was decreased by nearly 2400 times; when uninfected mice were injected with BD-368-2, they were protected from the virus infection.

The potent neutralizing antibody could be used to develop drugs for both therapeutic intervention and prophylactic protection against SARS-CoV-2.