The Chinese University of Hong Kong
Non-confidential Abstract of Technology Disclosure

Title:

Monoclonal Antibodies to SARS-CoV Nucleocapsid and X1 Proteins

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Inventor(s):

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Non-confidential abstract:

Generation of SARS-CoV-specific monoclonal antibodies for diagnostic and research applications for SARS.

SARS coronavirus (CoV) is the primary agent for Acute Respiratory Syndrome (SARS) [(1)]. SARS-CoV imposes one of the largest social economic burdens on the affected communities. This virus is approximately 30Kb in length with 11 open reading frames. Like other members of the coronavirus family, SARS-CoV has a spike (S) protein, which is responsible for binding to the host receptor to gain entry into the cell. The virus also makes proteins with structural functions, such as the envelope (E), matrix (M), and nucleocpasid (N) proteins. N protein is probably the most immunogenic antigen of SARS-CoV. Recent work has shown that immunization of animals against N protein can induce T-cell immunity and protection against infection [(2-3)]. Intriguingly, the genome of SARS-CoV contains several putative open reading frames (ORFs) of poorly understood functions, too. One of these ORFs encodes a protein known as X1. X1 protein is immunogenic; circulatory antibodies to the protein can be detected in patients infected by SARS-CoV. It has also been reported recently that X1 may have any important role in causing apoptosis to the infected cells [(4)]. We have generated lgG1 and lgM monoclonal antibodies to N and X1 proteins. All of the antibodies can be used in ELISA, Western blotting, and immunofluorescence for detection of the viral proteins. All of the lgG1 monoclonal antibodies are applicable in immunoprecipitation; the lgM antibodies have not yet been tested for that application. These monoclonal antibodies will be useful as an experimental tool for further research in the biological functions of the viral proteins, as diagnostic reagents for the viral infection, and potentially as therapeutic agents.

(1) Drosten C., et al. (2003) Identification of a novel coronavirus in patients with severe acute respiratory syndrome. N Engl J Med. 348:1967-76.

(2) Gao W., et al. (2003) Effects of a SARS-associated coronavirus vaccine in monkeys. Lancet. 362:1895-6.

(3) Kim TW., et al. (2004) Generation and characterization of DNA vaccines targeting the nucleocapsid protein of severe acute respiratory syndrome coronavirus. J Virol. 78:4638-45.

(4) Law PTW., et al. (2005) The 3a protein of severe acute respiratory syndrome-associated coronavirus induces apoptosis in Vero E6 cells. J Gen Virol. 86:1921-1930.

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