Research

Monoclonal antibodies for research, diagnostic and therapeutic applications

Antibodies are reagents commonly used in different areas of biomedical research as well as diagnostic and therapeutic applications. The monoclonal antibody unit (MAU) uses monoclonal antibodies as tools to characterize and combat RNA viruses that can infect and cause severe diseases in human. Currently, we are working on the severe acute respiratory syndrome coronavirus (SARS-CoV), hepatitis C virus (HCV) and influenza A virus. For example, we have generated and characterized a potent neutralizing antibody that binds the hemagglutinin (HA) protein of the H5N1 influenza A virus and blocks the entry of different clades of H5N1 into MDCK cells (Oh et al., J Virol. 2010 Aug;84(16):8275-86). This antibody was also shown to protect mice against lethal H5N1 viral challenge.
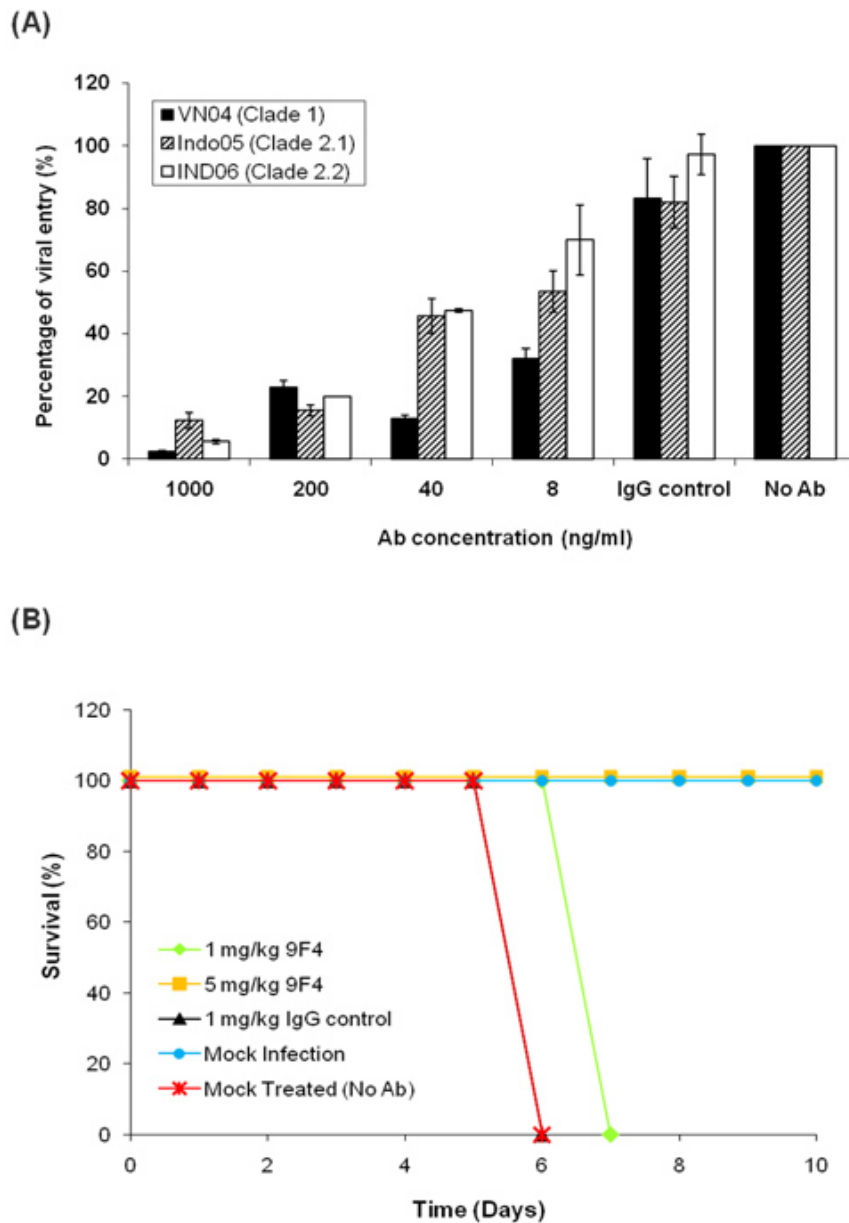
Figure: Monoclonal antibody (MAb) 9F4 prevents viral entry and protects mice against lethal H5N1 viral challenge. (A) Pseudotyped lentiviral particles harboring the HA proteins from H5N1 influenza viruses of clade 1 (VN04-H5pp), clade 2.1 (Indo5-H5pp), and clade 2.2 (IND06-H5pp) were incubated with different concentrations of MAb 9F4 at 4°C for 2 h before inoculation onto MDCK cells. Luciferase activity in the cell lysates was determined 72 h postinfection. Viral entry, as indicated by the luciferase activity, was expressed as a percentage of the reading obtained in the absence of antibody (No Ab), which was set at 100%. A control MAb of the same isotype (IgG control) was used at the highest concentration tested. (B) To test for prophylactic efficacy, BALB/c mice were immunized either with MAb 9F4 at different doses, with an irrelevant IgG control MAb (1 mg/kg), or with PBS and were subjected to viral challenge with clade 2.3 H5N1 virus 24 h later. A group of mice was mock infected. Mice were observed daily for disease and mortality. Percentages of mice surviving are plotted against the days post infection.