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Biological features of human catalytic antibody light chains possessing the ability against the infection of influenza virus

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We are developing catalytic antibody light chains (human antigenases) by using the human genes belonging to subgroup II, which exhibit some unique features such as enzymatic function and also anti-virus infection. We amplified and cloned cDNAs encoding the human antibody light chains (kappa) belonging to subgroup II. The obtained cDNAs were transformed into E. coli and then expressed as the protein. The highly purified (over 95%) antigenases were submitted to the following experiments. Several antigenases out of over 200 antigenases investigated showed the suppressive effect on the infectivity of influenza virus H1N1 not only *in vitro* but also *in vivo* assay. 22F6 antigenase clearly prevented from the infection of influenza virus H1N1 *in vivo*, where PR-8 strain was used. The serum titer of the mice inoculated with antigenase treated virus was substantially low even at 21 dpi, comparing with the positive control, suggesting the lost of antigenicity of the virus. Taking into account that the antigenase showed the catalytic activity as DNase and RNase, the loss of the infectivity may be due to the cleavage of the virus RNA by the antigenase. On the other hand, 23D4m also possessed a suppressive function for the infection of influenza virus *in vivo*, while it is a monomeric light chain. In the investigation of nasal inoculation schedule of 23D4m, it clearly showed anti-viral effect under the simultaneous inoculation of the virus and the light chain. These results suggest that the above antigenases have the high possibility to prevent from the infection of influenza virus.

Biography

Emi Hifumi has obtained her PhD from Kyushu University and studied Antibody Engineering and Catalytic Antibody. She was a Research Assistant at Hiroshima Prefectural University and is currently a Professor at Oita University from 2007. She has published more than 30 papers in reputed journals.

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