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Molecular Mimicry between Fc Receptor and S Peplomer Protein of Mouse Hepatitis Virus, Bovine Corona Virus, and Transmissible Gastroenteritis Virus [Abstract]

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Molecular Mimicry between Fc Receptor and S Peplomer Protein of Mouse Hepatitis Virus, Bovine Corona Virus, and Transmissible Gastroenteritis Virus [Abstract]

We have previously demonstrated molecular mimicry between the S peplomer protein of mouse hepatitis virus (MHV) and Fc gamma R (FcγR). A monoclonal antibody (MAb) to mouse FcγR (2.4G2 anti-FcγR MAb), purified rabbit immunoglobulin, but not their $F(ab')_2$ fragments, as well as mouse and rat IgG, immunoprecipitated (1) recombinant S peplomer protein expressed by a vaccinia virus recombinant in human, rabbit, and mouse cells, and (2) natural S peplomer protein from cells infected with several strains of MHV and MHV escape mutants. We report here results of studies documenting molecular mimicry between FcγR and S peplomer protein of viruses representing three distinct antigenic subgroups of the Coronaviridae. We have shown a molecular mimicry between the S peplomer protein of bovine corona virus (BCV) and FcγR. The 2.4G2 anti-FcγR MAb, rabbit IgG, but not its $F(ab')_2$ fragments, as well as homologous bovine serum, free of anti-BCV antibodies, immunoprecipitated S peplomer protein of BCV (Mebus strain). In contrast, we did not find molecular mimicry between S peplomer protein of human corona virus (HCV-OC43) and FcγR. Although the OC43 virus belongs to the same antigenic group as MHV and BCV, MAb specific for human FcγR I or FcγR II and purified human IgG_1, IgG_2, and IgG_3, myeloma proteins did not immunoprecipitate the S peplomer protein from HCV-OC43-infected RD cells. In addition, we did demonstrate molecular mimicry between the S peplomer protein of porcine transmissible gastroenteritis virus (TGEV) and FcγR. TGEV belongs to the second antigenic subgroup of coronaviridae. Homologous swine IgG, but not its $F(ab')_2$ fragments, immunoprecipitated from TGEV-infected cells a 195-kDa polypeptide corresponding to the TGEV S peplomer protein. We have also examined whether there is a molecular mimicry between S peplomer protein of infectious bronchitis virus (IBV) and FcγR. Nonimmune chicken IgG did not immunoprecipitate the S peplomer protein from IBV-infected chicken embryo fibroblasts or Vero cells, suggesting that there is no molecular mimicry between the IBV-S and FcγR. In conclusion, we have demonstrated molecular mimicry between FcγR and S peplomer protein of three members of Coronaviridae, namely MHV, BCV, and TGEV. In contrast, the S peplomer protein of two other members of Coronaviridae, namely HCV-OC43 and IBV, did not exhibit any molecular mimicry with FcγR.