Review of “The novel coronavirus 2019 (2019-nCoV) uses the SARS-coronavirus receptor ACE2 and the cellular protease TMPRSS2 for entry into target cells”


One-Minute Summary

- This paper examines 2019-nCoV cell entry using viral pseudotypes. These are artificial viruses that express the 2019-nCoV spike (S) protein, the protein used by 2019-nCoV to gain entry into cells.
- The ability of these pseudotypes expressing S protein from SARS-CoV and 2019-nCoV to enter various cell lines of human and animal origin under a number of experimental conditions was assessed.
- Amino acid analysis and cell culture experiments showed that, like SARS-CoV, 2019-nCoV S protein binds to angiotensin-converting enzyme 2 (ACE2) and uses a cellular protease TMPRSS2 for priming. Priming activates the S protein to facilitate viral fusion and entry into cells.
- The authors suggest that TMPRSS2 could be a potential therapeutic target for 2019-nCoV since entry into cells is reduced by camostat mesylate, a TMPRSS2 inhibitor.
- Serum from a convalescent SARS-CoV patient neutralized S-protein mediated entry into cells, suggesting that the antibody response to SARS-CoV may offer some protection against 2019-nCoV.

Additional Information

- This study used viral pseudotypes based on vesicular stomatitis virus (VSV) particles, not cultured 2019-nCoV virus.
- 2019-nCoV S protein does not use the same entry receptor as MERS-CoV (human DPP4) or the seasonal coronavirus 229E (human APN).
- Camostat mesylate is approved for human use in Japan for another indication.
- Convalescent serum used in this study was from a single SARS-CoV patient.
- All studies were performed in vitro using immortalized cell lines only.

PHO Reviewer’s Comment

This article has not been peer reviewed.
Citation

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