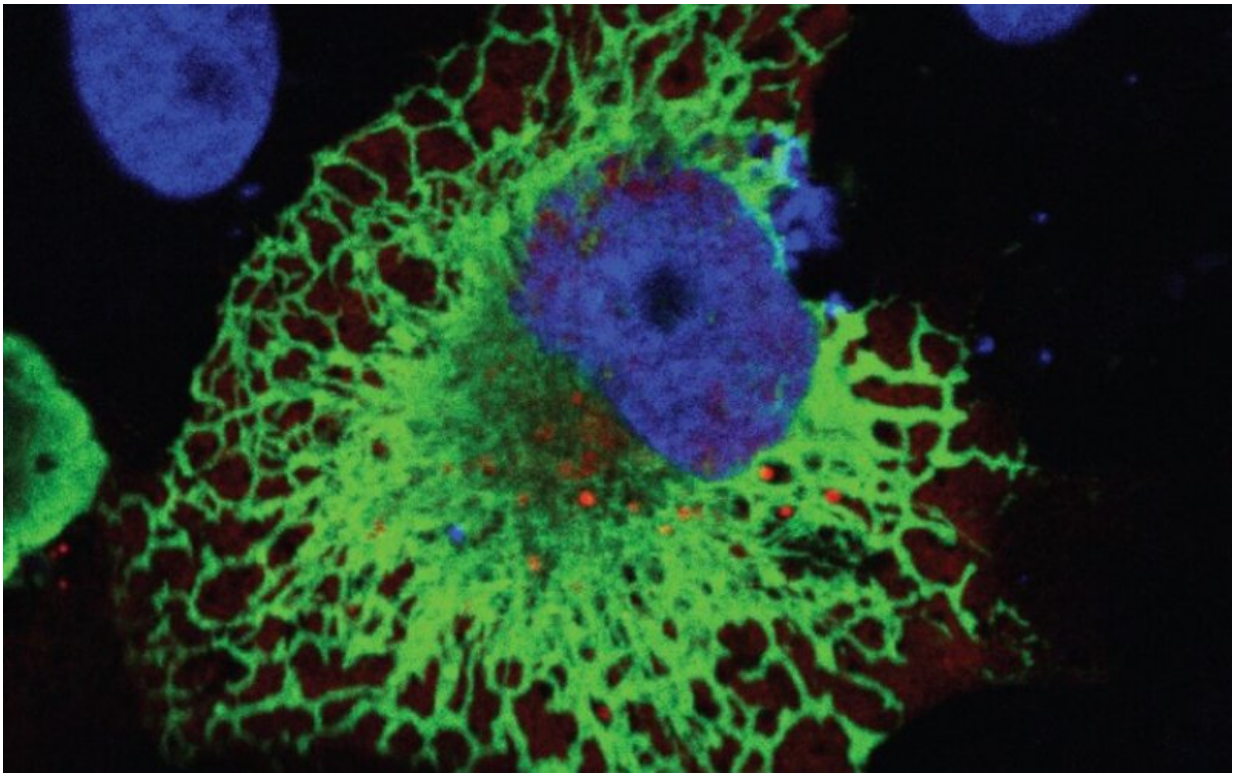
Protein domain common to plants and animals plays role in COVID-19 infection

April 17 2023, by Stephanie Seay



ORNL scientists mutated amino acids in a receptor protein, shown in green, which diminished interaction with the SARS-CoV-2 virus spike protein, shown in red. Mutating the receptor protein hampered the virus's ability to infect host cells. Credit: ORNL, U.S. Dept. of Energy

Oak Ridge National Laboratory scientists exploring bioenergy plant genetics have made a surprising discovery: a protein domain that could

lead to new COVID-19 treatments.

Researchers found the same plasminogen-apple-nematode, or PAN, domain studied by ORNL in plants like poplar and willow is also present in the human NRP1 receptor protein. NRP1 is less studied than the ACE-2 receptor targeted by current COVID-19 treatments, but this research shows its promise as a future therapeutic target.

By mutating amino acids called cysteine residues in the PAN domain of NRP1, researchers disrupted the ability of the SARS-CoV-2 virus to use its spike protein to invade cells, as described in *iScience*. ORNL scientists have also linked PAN to the growth of cancerous tumors.

"This project provides more evidence that PAN is involved in host cell invasion," said ORNL's Wellington Muchero. "By pinpointing these amino acids, researchers could reduce viral interaction with host cells."

More information: Debjani Pal et al, Mutating novel interaction sites in NRP1 reduces SARS-CoV-2 spike protein internalization, *iScience* (2023). DOI: 10.1016/j.isci.2023.106274

Provided by Oak Ridge National Laboratory

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