Researchers tackle viruses with pandemic potential

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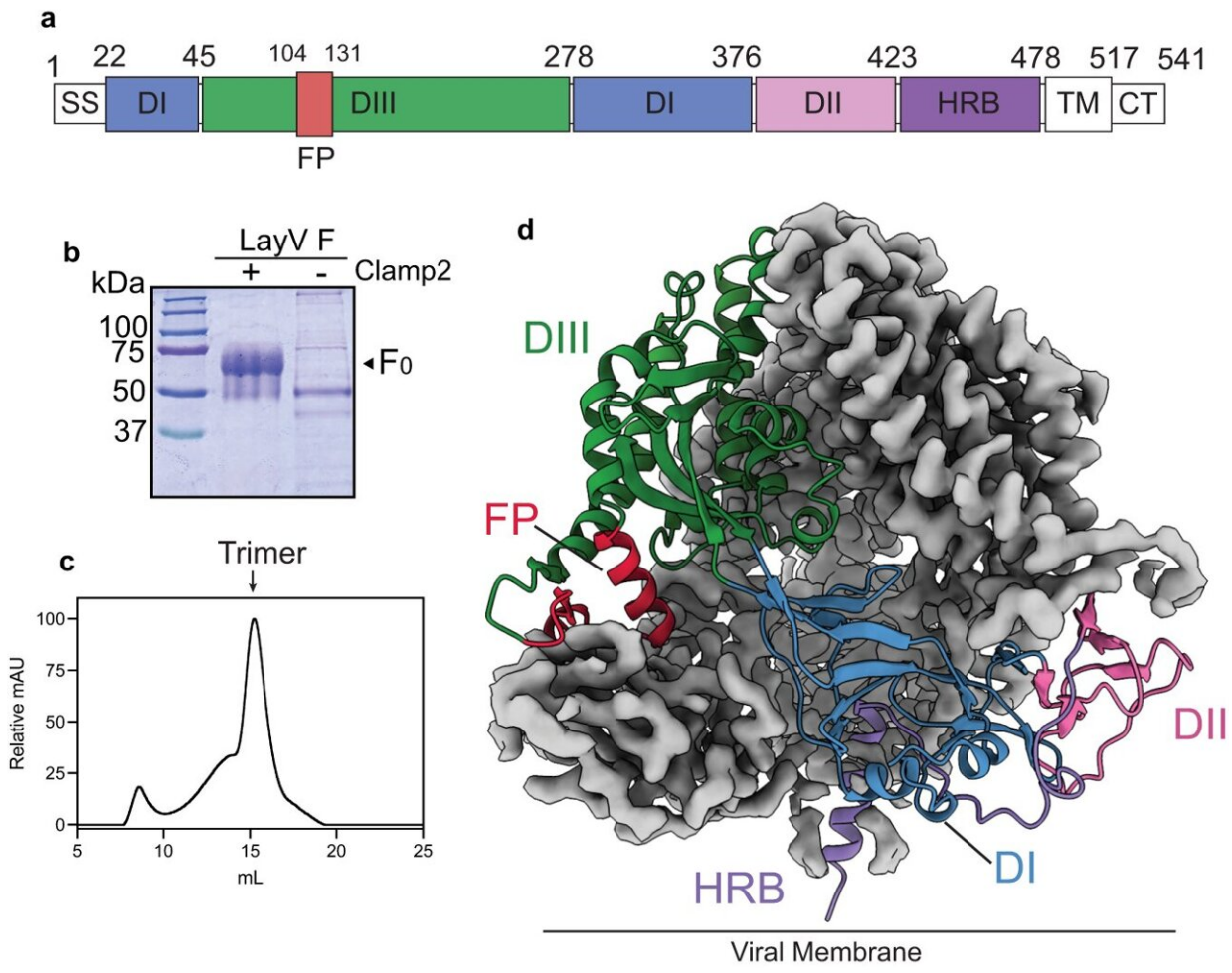

Cryo-EM structure of LayV F glycoprotein in the prefusion form. a) Gene schematic of LayV F with each domain colored. Domains colored in white are not included in the final structure. b) SDS-PAGE of purified LayV F proteins under reducing conditions either stabilized with clamp2 or unstabilised. c) SEC of LayV F clamp2 ran on Superose 6 Increase 10/300 GL column. Trimer peak

is indicated. d) Cryo-EM map (gray) resolved to 3.67 Å and generated model colored as in (a) of prefusion LayV F.

Researchers have shed light on how a highly infectious virus, that has recently transferred from animals to people, is able to enter human cells.

The University of Queensland's Dr. Ariel Isaacs and Dr. Yu Shang Low have uncovered the structure of the fusion protein of Langya virus, which was discovered in people in eastern China in August 2022. The research is published in *Nature Communications*.

Dr. Isaacs said the virus caused fever and severe respiratory symptoms and was from the same class of viruses as the deadly Nipah and Hendra viruses. "We're at an important juncture with viruses from the Henipavirus genus, as we can expect more spill over events from animals to people," Dr. Isaacs said. "It's important we understand the inner workings of these emerging viruses, which is where our work comes in."

The team used UQ's molecular clamp technology to hold the fusion protein of the Langya virus in place to uncover the atomic structure using cryogenic electron microscopy at UQ's Center for Microscopy & Microanalysis.

"Understanding the structure and how it enters cells is a critical step towards developing vaccines and treatments to combat Henipavirus infections," Dr. Isaacs said. "There are currently no treatments or vaccines for them, and they have the potential to cause a widespread outbreak."

Associate Professor Daniel Watterson, a senior researcher on the project, said they also saw that the Langya virus fusion protein structure

is similar to the deadly Hendra virus, which first emerged in southeast Queensland in 1994.

"These are viruses that can cause severe disease and have the potential to get out of control if we're not properly prepared," Dr. Watterson said.

"We saw with COVID-19 how unprepared the world was for a widespread viral outbreak and we want to be better equipped for the next outbreak."

The researchers will now work to develop broad-spectrum human vaccines and treatments for Henipaviruses, such as Langya, Nipah and Hendra.

More information: Ariel Isaacs et al, Structure and antigenicity of divergent Henipavirus fusion glycoproteins, *Nature Communications* (2023). DOI: 10.1038/s41467-023-39278-8

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