Molecular anatomy of influenza virus detailed

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Scientists at the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), part of the National Institutes of Health in Bethesda, Md., and colleagues at the University of Virginia in Charlottesville have succeeded in imaging, in unprecedented detail, the virus that causes influenza.

A team of researchers led by NIAMS' Alasdair Steven, Ph.D., working with a version of the seasonal H3N2 strain of influenza A virus, has been able to distinguish five different kinds of influenza virus particles in the same isolate (sample) and map the distribution of molecules in each of them. This breakthrough has the potential to identify particular features of highly virulent strains, and to provide insight into how antibodies inactivate the virus, and how viruses recognize susceptible cells and enter them in the act of infection.

"Being able to visualize influenza virus particles should boost our efforts to prepare for a possible pandemic flu attack," says NIAMS Director Stephen I. Katz, M.D., Ph.D. "This work will allow us to 'know our enemy' much better."

One of the difficulties that has hampered structural studies of influenza virus is that no two virus particles are the same. In this fundamental respect, it differs from other viruses; poliovirus, for example, has a coat that is identical in each virus particle, allowing it to be studied by crystallography.

The research team used electron tomography (ET) to make its discovery. ET is a novel, three-dimensional imaging method based on the same principle as the well-known clinical imaging technique called computerized axial tomography, but it is performed in an electron microscope on a microminiaturized scale.

Source: NIH/National Institute of Arthritis and Musculoskeletal and Skin Diseases