



**Biophysical Society 61st Meeting, Feb. 11-15, 2017,
New Orleans, Louisiana**

The Flu Gets Cold

*Researchers establish that cryo-electron tomography imaging
can be used to screen potential vaccine candidates for influenza
and many other infectious viruses*

EMBARGOED for release until 11:30 a.m. Eastern Time on
Wednesday, Feb. 15, 2017

For More Information:
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WASHINGTON, D.C., February 15, 2017 -- In an effort to one day eliminate the need for an annual flu shot, a group of researchers from the National Institutes of Health (NIH) and Icahn School of Medicine at Mount Sinai are exploring the surface of influenza viruses, which are covered by a protein called “hemagglutinin” (HA). This particular protein is used like a key by viruses to open cells and infect them, making it an ideal target for efforts to help the body's immune system fight off a wide range of influenza strains.

Erin Tran, a staff scientist who works in the Laboratory of Cell Biology/Biophysics Section of the NIH National Cancer Institute, will present the research at the Biophysical Society’s 61st Annual Meeting in New Orleans, Louisiana, which runs from Feb. 11-15, 2017. Tran has been using cryo-electron microscopy (cryo-EM) methods to determine whether the spike-shaped HA proteins in their native environment embed themselves within the viral membrane, mimicking what the body might see when it is exposed to influenza viruses. The work is part of an ongoing collaboration between the laboratories of Peter Palese and Florian Krammer at Mount Sinai and Sriram Subramaniam at NIH.

“In our case, this process starts with viruses suspended in liquid,” Tran said. “A few drops of the virus suspension -- containing thousands of viruses -- are placed onto a tiny, circular copper grid. Extra liquid is blotted away with filter paper, and the grid is immediately plunged into a pool of liquid ethane, which is maintained at a temperature around -180° C. This freezes the viruses in a very thin layer of glass-like ice and allows us to image them in their native state.”

Once frozen, the viruses are imaged using an electron microscope.

“We get a three-dimensional image using a procedure that involves collecting a series of images of the virus at different orientations relative to the incident electron beam,” she said. “HA spike protein images from single viruses are ‘noisy,’ but by averaging images from multiple viruses we can obtain a more accurate representation of the shape of the HA surface protein.”

Tran and colleagues were surprised by the flexibility and resilience shown by the influenza HA protein. When the proteins are made from two different DNA strains, and consequently called chimeric, the team found a dramatic twist.

“The head portion of the protein is offset from the stalk portion by nearly 60 degrees, yet viruses that express these chimeric HAs are still functional and the chimeric protein is still able to bind antibodies that target either the head or stem of the protein,” said Tran. “[The work] shows that cryo-electron tomography can be used as an effective way to characterize influenza vaccine candidates in the native context.”

Their next goal is to find out whether the structural changes they see in this particular chimeric HA protein are representative of a broader set of chimeric HAs.

“In general, we’re interested in using cryo-electron microscopy and tomography to visualize the mechanisms viruses use to infect cells,” said Tran. “We’re exploring a variety of enveloped viruses, including HIV and Ebola, to better understand mechanisms by which their entry into cells can be blocked.”

2878-Pos/B485 "Cryo-em tomographic analysis of a universal influenza virus vaccine candidate" is authored by Erin Tran, K. Podolsky, A. Bartesaghi, O. Kuybeda, G. Grandinetti, T. Wohlbold, G. Tan, R. Nachbagauer, P. Palese, F. Krammer and S. Subramaniam. It will be at 10:30-12:30 p.m. Central Time on Wednesday, February 15, 2017 in Hall B-2 & C of the Ernest N. Morial Convention Center.

ABSTRACT: <http://www.abstractsonline.com/pp8/#!/4279/presentation/1882>

Image caption: A three-dimensional image of an influenza virus bound to antibodies that block infection Credit: Amy Moran/National Library of Medicine



MORE MEETING INFORMATION

ABOUT THE MEETING

Each year, the Biophysical Society Annual Meeting brings together more than 6,000 researchers working in the multidisciplinary fields representing biophysics. With more than 3,600 poster presentations, over 200 exhibits, and more than 20 symposia, the BPS Annual Meeting is the largest meeting of biophysicists in the world. Despite its size, the meeting retains its small-meeting flavor through its subgroup symposia, platform sessions, social activities and committee programs. The 61st Annual Meeting will be held at Ernest N. Morial Convention Center in New Orleans, Louisiana.

PRESS REGISTRATION

The Biophysical Society invites professional journalists, freelance science writers and public information officers to attend its Annual Meeting free of charge. For press registration, contact Ellen Weiss at EWweiss@biophysics.org or the Media Line at the American Institute of Physics at media@aip.org or 301-209-3090.

NEWS RELEASES

Embargoed press releases describing in detail some of the breakthroughs to be discussed at the meeting are available on Newswise and Alpha Galileo or by contacting the Media Line at the American Institute of Physics at media@aip.org or 301-209-3090.

QUICK LINKS

Main Meeting Page: <http://www.biophysics.org/2017meeting/Home/tabid/6672/Default.aspx>

Symposia:

<http://www.biophysics.org/2017meeting/Program/ScientificSessions/Symposia/tabid/6756/Default.aspx>

Desktop planner: <http://www.abstractsonline.com/pp8/#!/4279>

ABOUT THE SOCIETY

The Biophysical Society, founded in 1958, is a professional, scientific Society established to encourage development and dissemination of knowledge in biophysics. The Society promotes growth in this expanding field through its annual meeting, monthly journal, and committee and outreach activities. Its 9,000 members are located throughout the U.S. and the world, where they teach and conduct research in colleges, universities, laboratories, government agencies, and industry. For more information on the Society, or the 2017 Annual Meeting, visit <http://www.biophysics.org>.

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