

**Biophysical Society 62nd Meeting, Feb. 17-21,
2018, San Francisco, California**

An Enzyme's Evolution from Changing Electric Fields and Resisting Antibiotics

Using the vibrational Stark effect, researchers at Stanford University are probing the relationship between electric fields, catalysis and evolution.

EMBARGOED for release until 8 a.m. EST on Monday, Feb. 19,
2018

For More Information:
AIP Media Line
media@aip.org
301-209-3090

WASHINGTON, D.C., February 19, 2018 -- Enzymes are proteins that speed up or catalyze a reaction in living organisms. Bacteria can produce enzymes that make them resistant to antibiotics. Specifically, the TEM beta-lactamase enzyme enables bacteria to develop a resistance to beta-lactam antibiotics, such as penicillin and cephalosporins. Researchers at Stanford University are studying how an enzyme changes and becomes antibiotic-resistant.

During the Biophysical Society's 62nd Annual Meeting, held Feb. 17-21, 2018, in San Francisco, California, Samuel H. Schneider, a graduate student in Stanford University's Boxer Lab, will present the group's research studying what happens when an enzyme is accelerating a reaction and how an enzyme changes over time making it resistant to antibiotics.

Researchers have been trying to figure out exactly what is happening when an enzyme binds to another molecule and ultimately, how that enzyme becomes resistant to antibiotics.



The team of researchers at the Boxer Lab is using an existing technique called the vibrational Stark effect (VSE) in a novel way to measure a molecule's electric field when the enzyme and molecule are attached at different times during the enzyme's evolution to becoming resistant to antibiotics.

The team measured the electric fields generated by a TEM beta-lactamase enzyme attached to two different molecules and the vibration of the chemical bonds in these molecules in the hopes that they will find what makes the enzyme develop a resistance to cephalosporins antibiotics.

Going forward, the team hopes to expand the study to thousands of variants of these enzymes "to understand the correlation between the evolution of electric fields in enzymes and the development of [antibiotic] resistances," said Jacek Kozuch, a postdoctoral researcher working in the Boxer Lab.

1007-Plat - "The physical origins of enzyme evolution: Correlating the active site electric fields of antibiotic resistance along evolutionary trajectories in TEM β -lactamases" is authored by Samuel H. Schneider, Jacek A. Kozuch and Steven G. Boxer. It will be presented at 11:30 a.m PST, Monday, Feb. 19, 2018, in Esplanade, Room 153 of the Moscone Center, South. Abstract: <https://plan.core-apps.com/bpsam2018/abstract/ea4b4250733473141a814abfbdfd1e4d>

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 62nd Annual Meeting will be held at the Moscone Center (South) in San Francisco, California.

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 EWeiss@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 EurekAlert!, 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: <https://www.biophysics.org/2018meeting/Home/tabid/7117/Default.aspx>

Symposia:

<https://www.biophysics.org/2018meeting/Program/ScientificSessions/Symposia/tabid/7192/Default.aspx>

Desktop Planner:

<http://www.biophysics.org/2018meeting/GeneralInfo/MobileApp/tabid/7473/Default.aspx>

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 2018 Annual Meeting, visit <http://www.biophysics.org>.