



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

**Using Mutant Bacteria to Study How Changes
in Membrane Proteins Affect Cell Functions**

Fluctuations in phospholipid composition can cause changes in membrane protein function, providing a previously unrecognized way to control cellular processes.

EMBARGOED for release until 8 a.m. EST on Sunday, Feb. 18, 2018

For More Information:

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WASHINGTON, D.C., February 18, 2018 -- Phospholipids are water insoluble “building blocks” that define the membrane barrier surrounding cells and provide the structural scaffold and environment where membrane proteins reside. During the 62nd Biophysical Society Annual Meeting, held Feb. 17-21, in San Francisco, California, William Dowhan from the University of Texas-Houston McGovern Medical School will present his group’s work exploring how the membrane protein phospholipid environment determines its structure and function.

There are two types of membrane proteins inside the phospholipid environment. “Hydrophilic (water-loving) are exposed on the membrane surface where they stably interact with the aqueous environment surrounding membranes, and hydrophobic (water-repelling) are exposed to the interior of membranes,” Dowhan said.

Because of this balance of hydrophilic and hydrophobic proteins on the inside and outside side of the cell membrane, the conditions remain stable. “For example, the hydrophilic (proteins) on one side of the membrane shouldn’t flip through the hydrophobic core of the membrane to the other side,” Dowhan said.

This made Dowhan wonder why “cells maintain thousands of unique phospholipid species.” To find out, his group constructed mutants of the bacterium *Escherichia coli* and the yeast *Saccharomyces cerevisiae* in which the composition of these “building blocks” could be varied. “As we varied the membrane phospholipid composition, we adversely affected cellular functions.” Dowhan said.

These are significant findings, because “membrane proteins are initially made in the endoplasmic reticulum (inside cell), then transported to other membranes where they function,” Dowhan said. “So, a change in phospholipid environment during this transport process ... within a membrane, can change a protein’s structure and function. The importance of dynamic changes in membrane protein function related to phospholipid composition is an unrecognized way of controlling cellular processes.”

How cells regulate various processes is central to maintaining cell viability, and it’s a unique property of each cell type. “To fully understand life, we not only need to define each chemical reaction within a cell but also how each is regulated and integrated with each other,” Dowhan said.

119-Plat - “Lipids as determinants of membrane protein structure” is authored by William Dowhan, Mikhail Bodanov and Heidi Vitrac. It will be presented at 10 a.m. PST, Sunday, Feb. 18, 2018, in the Esplanade, Room 156 of the Moscone Center, South. Abstract: <https://plan.core-apps.com/bpsam2018/abstract/598979c882021290aae09439cc2f9905>

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>.