Biophysical Society

Media Invited: Biophysical Society Annual Meeting to Highlight Innovations in Medicine, Physics, and More

Honeybee silk-inspired materials; a deconstruction of the Ebola virus; how microbes evolve resistance to antibiotics; and a possible connection between Alzheimer's disease and type II diabetes are just some of the intriguing topics that will be presented at the 57th Annual Meeting of the Biophysical Society (BPS).

The conference will take place Feb. 2 - 6, 2013, at the Pennsylvania Convention Center in Philadelphia, Pa. With more than 6,000 research scientists in attendance each year, the Annual Meeting is the largest meeting of biophysicists in the world.

Credentialed journalists, freelance reporters working on assignment, and public information officers may attend the meeting free of charge. For more information on press registration, see below.

Preliminary Highlights

SUNDAY, FEBRUARY 3

Honeybee Silk: Silkworms and spiders get most of the attention, but honeybees also make silk. Researchers are using what they have learned about bee silk to design recombinant materials with a wide range of properties and potential applications.
Presentation #248-Pos: "Artificial honeybee silk: A recombinant protein as a biomimetic structural material" http://tinyurl.com/acaztaq

Chemical Pathways of Psychosis: A broad spectrum of symptoms has been seen in psychotic disorders, but nearly 70 years of research has produced anti-psychotic drugs that alleviate only some of these symptoms and can cause significant side effects. Recent work that illuminates the complex chemical interrelationships among certain receptors in the brain could lead to better management of psychotic disorders.
Presentation #595-Pos: "Functional signaling changes resulting from GPCR heteromerization: Relevance to psychosis"
http://tinyurl.com/bhhsz7h

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Autism on a Cellular Level: Scientists study abnormalities within a group of chemicals associated with autism to find the mutations most likely responsible for the disease.
Presentation #118-Plat: "Functional evaluation of autism associated mutations in SLC9A9 (NHE9)" http://tinyurl.com/apjmm7a

The Modus Operandi of a Parasite: Encephalitis and other neurologic diseases are the potential consequences of an infection with *T. gondii*, a cousin of the parasite that causes malaria. Researchers explore how this protozoan infects its host on a cellular level.
Presentation #716-Pos: "Toxoplasma gondii targets the host actin cytoskeleton during invasion, go figure…" http://tinyurl.com/am4ddxl

MONDAY, FEBRUARY 4

Seeing Cell Temperature: The temperature of a cell's inner parts can reveal much about its health. A new virtual thermometer that shows how temperature is distributed within a living cell may yield new insights into cell function.
Presentation #1033-Plat: "Imaging of temperature distribution in a living cell"
http://tinyurl.com/b6dnae6

The Nanomechanical Signature of Breast Cancer: When healthy breast tissue transforms into cancerous tissue, its mechanical properties also change. Examining cells' stiffness profiles may reveal a new signature of breast cancer.
Presentation # 1639-Pos: "The nanomechanical signature of breast cancer"
http://tinyurl.com/b2edbq6

Listening to Cells: Cells could have a lot to tell us, if we could only listen. A new noninvasive technique allows researchers to probe the insides of cells with sound.
Presentation # 991-Plat: "Listening to cells: A non-contact optoacoustic nanoprobe"
http://tinyurl.com/a3a8oxs

TUESDAY, FEBRUARY 5

Cheaters versus Cooperators: At the scale of cells, cooperators and cheaters wage constant battle. A new model shows how these two warring factions can survive in a state of perpetual conflict.
Presentation # 2530-Pos: "Diffusion of public goods prevents coexistence of cooperators and cheaters in a stochastic competition model" http://tinyurl.com/ba46sdb

Type II Diabetes and the Alzheimer's Connection: Scientists illustrate for the first time the interactions between amyloid beta and amylin, two proteins that are associated

with Alzheimer's disease and type II diabetes respectively. By identifying the "hot regions" that allow one protein to bind to the other, researchers hope to provide insight into the links between these two incurable conditions.
Presentation #2008-Pos: "Investigating the interactions between Aβ and amylin: Insight into the link between Alzheimer's and type II diabetes" http://tinyurl.com/a7y6seh

Flight of the Bumblebee…with X-rays: Using ultrafast visualization, researchers examine the alternating actions of two flight muscles used by bumblebees. The work may provide new insights into how motor proteins work on a biochemical level.
Presentation #2482-Pos: "Coordination of two antagonistic flight muscles during wing-beat of bumblebee visualized by ultrafast X-ray diffraction movies"
http://tinyurl.com/apxvx5c

Deconstructing Ebola: No vaccine or treatment exists for an infection with the deadly Ebola virus, which causes internal and external bleeding. To better understand how the virus assembles itself, researchers investigate the mechanistic details of a key protein using an interdisciplinary approach.
Presentation #2135-Pos: "Elucidating the mechanism of Ebola virus assembly and budding" http://tinyurl.com/bjp2dlo

WEDNESDAY, FEBRUARY 6

A Heat-targeted Drug Delivery Scheme: Elastin-like Polypeptides (ELPs) – genetically engineered proteins that respond to heat – are being explored as a potential drug delivery system.
Presentation #2838-Plat: "Biophysical analysis of a novel drug delivery vector: ELP[V5G3A2-150]" http://tinyurl.com/anfecds

Blasting the Way to Brain Injury Treatment: Researchers study the effects of blast-induced traumatic brain injuries on astrocytes, star-shaped cells that play a role in the repair process for brain and spinal cord injuries. Using a device that delivers shock waves to cultures of human central nervous system (CNS) cells, they identify changes in the signaling behavior of astrocytes, suggesting a potential therapeutic target for treating CNS trauma.
Presentation #3171-Pos: "Shock waves simulating blast-induced traumatic brain injury activate purinergic signaling in astrocytes" http://tinyurl.com/asl2p6n

Vitamin D to Fight Breast Cancer: High concentrations of vitamin D at a tumor site have been proposed as a possible treatment for inflammatory breast cancer. Using quantum dots, scientists report delivering the active form of vitamin D to breast cancer tumors in mice.

Presentation #2953-Pos: "Using calcitriol conjugated quantum dots to target inflammatory breast cancer tumors and metastasis in vivo" http://tinyurl.com/acw94xg

Tracking the Evolution of Antibiotic Resistance: Antibiotic resistance is, both literally and figuratively, an evolving threat to public health. Using a device called the "morbidostat," which adjusts drug concentrations to maintain a nearly constant inhibition of bacterial growth, researchers tracked how bacterial populations acquire resistances.
Presentation #3390-Pos: "Evolution of antibiotic resistance through a multi-peaked adaptive landscape" http://tinyurl.com/bfcke65

Lung Treatments for Sickle Cell: In sickle cell anemia, malformed red blood cells decrease the amount of oxygen reaching body tissues. New research suggests that changing oxygen levels in the lungs may potentially aid in the treatment of this disease.
Presentation #2872-Pos: "Oxygen-dependent depolymerization of sickle cell hemoglobin polymers in the lungs: Kinetic mechanisms and their significance for pathogenesis and its prevention" http://tinyurl.com/a6gax45

Penetrating the Blood-Brain Barrier with Sound: Delivering drugs to the brain requires passing through the blood-brain barrier, and previous research suggests that ultrasound stimulation can help. A new model and experiments indicate that nanodrugs can indeed be taken safely into the brain by manipulating the barrier using ultrasound.
Presentation #3539-Pos: "Impact of initial vascular permeability and recovery speed of disrupted blood-brain barrier on nanodrug delivery into the brain tissue" http://tinyurl.com/adycds6

This news release was prepared for the Biophysical Society (BPS) by the American Institute of Physics (AIP).

ABOUT THE 2013 ANNUAL MEETING
Each year, the Biophysical Society Annual Meeting brings together over 6,000 research scientists in the multidisciplinary fields representing biophysics. With more than 3,900 poster presentations, over 200 exhibits, and more than 20 symposia, the Annual Meeting is the largest meeting of biophysicists in the world. Despite its size, the meeting retains its small-meeting flavor through its subgroup meetings, platform sessions, social activities, and committee programs.

The 57th Annual Meeting will be held at the Pennsylvania Convention Center (1101 Arch Street, Philadelphia, PA 19107). For maps and directions, please visit: http://www.paconvention.com/explore-philadelphia/directions-and-parking.