

THE  
**PROTEIN  
SOCIETY**



**32ND ANNUAL SYMPOSIUM**

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**BOSTON**

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**JULY 9 - 12, 2018**

**PROGRAM**



[www.proteinsociety.org](http://www.proteinsociety.org)



# PROGRAM

DAY 1 - MONDAY, JULY 9, 2018

## Opening Plenary Session 8:30 - 9:10 a.m. | Salons E and F

- 8:30 - 8:35 a.m. *Intro & Welcome from The Protein Society President*  
**Charles L. Brooks III**, University of Michigan
- 8:35 - 8:40 a.m. *Presentation of the 2017 Christian B. Anfinsen award to Lewis Kay*
- 8:40 - 9:10 a.m. *Solution NMR: Why Bother?*  
**Lewis Kay**, University of Toronto, Canada

Coffee Break | 9:10 - 9:40 a.m. | Gloucester

## CONCURRENT MORNING SESSION 1 Propagating Aggregated Conformational States 9:40 - 11:30 a.m. | Salon E

- 9:40 - 9:45 a.m. *Introduction from Chair*  
**Dennis Özcelik**, University of Copenhagen, Denmark
- 9:45 - 10:15 a.m. *Remembering the Past: A New Form of Protein-Based Inheritance*  
**Dan Jarosz**, Stanford University; California, United States
- 10:15 - 10:45 a.m. *Amyloids: From the Origin to the End of Life*  
**Roland Riek**, ETH; Zurich, Switzerland
- 10:45 - 11 a.m. *Quantifying Nucleation In Vivo Reveals the Physical Basis of Prion-Like Phase Behavior*  
**Randal Halfmann**, Stowers Institute for Medical Research; Missouri, United States
- 11 - 11:30 a.m. *The Formation of Functional Amyloid Fibrils by Viral Proteins that Modulate Host Cell Death Pathways;*  
**Margaret Sunde**, University of Sydney; Australia

## CONCURRENT MORNING SESSION 2 Protein See the Light! Triggered Conformational and Functional Changes 9:40 - 11:30 a.m. | Salon F

- 9:40 - 9:45 a.m. *Introduction from Chair*  
**Michael Thompson**, University of California; San Francisco; California, United States
- 9:45 - 10:15 a.m. *A Shape-Shifting Protein Coordinates Timekeeping by the Cyanobacterial Circadian Clock*  
**Carrie Patch**, University of California, Santa Cruz; California, United States
- 10:15 - 10:45 a.m. *Circadian Rhythms from Coupled ATPase Domains*  
**Mike Rust**, The University of Chicago-Illinois; United States
- 10:45 - 11 a.m. *Interplay Between Active and Inactive States in Light-sensing Histidine Kinase EL346*  
**Igor Dikiy**, The City University of New York Advanced Science Research Center; New York, United States
- 11 - 11:30 a.m. *A Molecular Movie of Structural Changes in the Light-Driven Proton Pump Bacteriorhodopsin*  
**Eriko Nango**, Spring-8/SACLA; Kyoto, Japan

LUNCH  
11:30 a.m. - 1:30 p.m.  
Networking Lunch (RSVP-ONLY EVENT) | Third Floor Atrium

Boxed Lunch Pick Up Station | Gloucester

Poster Displays & Exhibits Open | Gloucester

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# PROGRAM

DAY 1 - MONDAY, JULY 9, 2018

## CONCURRENT AFTERNOON SESSION 3

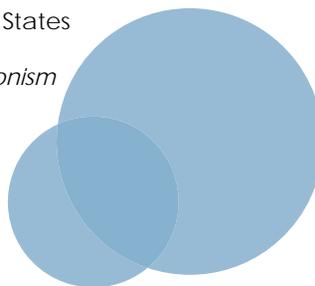
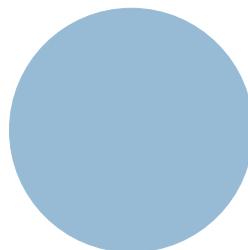
Creativity in Drug Discovery

1:30 - 4:30 p.m. | Salon E

- 1:30 - 1:35 p.m. *Introduction from Chair*  
**Hyuntae Na**, Penn State Harrisburg;  
Pennsylvania, United States
- 1:35 - 2:05 p.m. *Targeting Cancer Using Small Molecule Degraders*  
**Nathanael Gray**, Harvard University; Massachusetts;  
United States
- 2:05 - 2:35 p.m. *Electrophile Fragment Screening as a Rapid Method  
for Covalent Probe Discovery*  
**Nir London**, Weizmann Institute of Science;  
Rehovot, Israel
- 2:35 - 2:50 p.m. *Massively Parallel Protein Design to Develop Enzymes  
for Next-Generation Chemotherapy*  
**Brahm Yachnin**, Rutgers University; New Jersey,  
United States

### Coffee Break | 2:50 - 3:15 p.m. | Gloucester

- 3:15 - 3:45 p.m. *Constraining Evolution -- Avoiding Drug Resistance:  
Lessons from Viruses*  
**Celia Schiffer**, University of Massachusetts Medical  
School; Massachusetts; United States
- 3:45 - 4 p.m. *The Structural Basis for CARD9 and CARD11  
Autoinhibition*  
**Michael Holliday**, Genentech, California, United States
- 4 - 4:30 p.m. *A Structural Mechanism for Directing Inverse Agonism  
of PPAR?*  
**Douglas Kojetin**, The Scripps Research Institute;  
California, United States



## CONCURRENT AFTERNOON SESSION 4 Proteins in Control of Membranes

1:30 - 4:30 p.m. | Salon F

*Introduction from Chair*

**Elizabeth Draganova**, Tufts University;  
Massachusetts; United States

1:30 - 1:35 p.m.

1:35 - 2:05 p.m.

*Structural and Mechanistic Studies on the Dynamitin  
GTPase*

**Oliver Daumke**, Max Delbrück Center for Molecular  
Medicine; Berlin, Germany

2:05 - 2:35 p.m.

*Expanding Roles for the ESCRT Machinery*

**Phyllis Hanson**, Washington University;  
Missouri; United States

2:35 - 2:50 p.m.

*Protein Science Best Paper Award Winner  
Becn2 Interacts With Atg14 Through a Metastable  
Coiled-Coil to Mediate Autophagy*

**Minfei Su**, Weill Cornell Medical College;  
New York, United States

### Coffee Break I 2:50 - 3:15 p.m. | Gloucester

3:15 - 3:45 p.m.

*Chaperoning SNARE Assembly to Control Membrane  
Fusion*

**Fred Hughson**, Princeton University,  
Princeton, New Jersey; United States

3:45 - 4 p.m.

*Structure of the Human TRPM4 Ion Channel in a Lipid  
Nanodisc*

**Henriette Autzen**, University of California San Francisco;  
California, United States

4 - 4:30 p.m.

*The Initiation of Ubiquitin-Independent Mitophagy by  
Atg32*

**Michael Ragusa**, Dartmouth College;  
New Hampshire, United States

### POSTERS OPEN, EXHIBITS, MIX & MINGLE

4:30 - 6:30 p.m. | Gloucester

### Baseball Game (Red Sox vs. Rangers)

7:10 - 10:00 p.m. | Fenway Park



# PROGRAM

DAY 2 - TUESDAY, JULY 10, 2018

NEW MEMBER WELCOME BREAKFAST/MEMBER BUSINESS MEETING

7:30 - 8:15 a.m. | Berkeley Room

## CONCURRENT MORNING SESSION 5

Functional Protein Dynamics and Allostery

8:30 - 11:45 a.m. | Salon E

- 8:30 - 8:35 a.m. *Introduction from Chair*  
**Mylene Ferrolino**, St. Jude Children's Research Hospital; Tennessee, United States
- 8:35 - 9:05 a.m. *Ultra-Fast Photoswitching in Fluorescent Proteins Observed by Time-Resolved Serial Femtosecond Crystallography*  
**Martin Weik**, IBS; France
- 9:05 - 9:35 a.m. *Improved Physical Models Enable the Investigation of Molecular Recognition in Intrinsically Disordered Proteins at Atomistic Resolution*  
**Paul Robustelli**, DE Shaw Research; New York, United States
- 9:35 - 9:50 a.m. *Protein Science Best Paper Award Winner Single-Molecule Imaging Reveals the Translocation and dna Looping Dynamics of Hepatitis C Virus Ns3 Helicase*  
**Chang-Ting Lin**, Johns Hopkins University; Maryland, United States

## COFFEE BREAK | 9:50 - 10:15 a.m. | Gloucester

- 10:15 - 10:45 a.m. *The Evolution of Dynamic Amino Acid Interaction Networks Around the Catalytic Cycle of a Tryptophan Synthase*  
**David Boehr**, Pennsylvania State University; Pennsylvania, United States
- 10:45 - 11:15 a.m. *Allosteric Tuning of Hsp70 Molecular Chaperones*  
**Lila Gierasch**, U Mass Amherst; Massachusetts, United States
- 11:15 - 11:45 a.m. *Simulating the Dynamics of GTPases on the Ribosome*  
**Paul Whitford**, Northeastern University; Massachusetts, United States

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## CONCURRENT MORNING SESSION 6

Proteins in the Microbiome and Immune  
8:30 - 11:45 a.m. | Salon F

- 8:30 - 8:35 a.m. *Introduction from Chair*  
**Mikaela Stewart**, Texas Christian University; Texas, United States
- 8:35 - 9:05 a.m. LAPS Exchange Speaker  
*Metallo- $\beta$ -lactamases: a Tug of War between Bacteria and the Immune System for the available Zn(II)*  
**Alejandro Vila**, IBR/Universidad Nacional de Rosario, Santa Fe; Argentina
- 9:05 - 9:35 a.m. *Structural Biochemistry of Cellular Proteins Usurped by Viruses*  
**Blanton Tolbert**, Case Western Reserve University; Ohio, United States
- 9:35 - 9:50 a.m. *Interrogating a Multidrug Efflux Membrane Protein Transporter Involved In Bacterial Antibiotic Resistance Using Structural Mass Spectrometry*  
**Zainab Ahdash**, King's College, London, UK

## COFFEE BREAK | 9:50 - 10:15 a.m. | Gloucester

- 10:15 - 10:45 a.m. *Structure and Mechanism of an Exceptionally Powerful Motor that Powers Virus Assembly*  
**Brian Kelch**, University of Massachusetts Med School; Massachusetts, United States
- 10:45 - 11:15 a.m. *Weapons to Probes: Using Toxins to Study the Bacterial Cell Wall*  
**Seemay Chou**, University of California San Francisco; California, United States
- 11:15 - 11:45 a.m. *NMR Characterization of Changes in Acid-Stress Bacterial Chaperone HdeA as a Function of pH in Preparation for Activation*  
**Karin Crowhurst**, California State University Northridge; California, United States

## LUNCH | 11:45 a.m. - 1:30 p.m.

Boxed Lunch Pick Up Station | Gloucester

11:45 a.m. - 1:30 p.m. | Exhibitor Workshop Pall ForteBio, LLC | Arlington

Noon - 1:30 p.m. | Educator Workshop | St. Botolph

Poster Displays & Exhibits Open | Gloucester

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# PROGRAM

DAY 2 - TUESDAY, JULY 10, 2018 (CONT.)

## CONCURRENT AFTERNOON SESSION 7

Member-Selected Session

Repetitive, Non-Globular Proteins: Nature to Nanotechnology

1:30 - 4:30 p.m. | Salon E

- 1:30 - 1:35 p.m. *Introduction from Chair*  
**Mary Munson**, University of Massachusetts Medical School; Massachusetts, United States
- 1:35 - 2:05 p.m. *Repeat Protein Scaffolds for the Design of Functional Nanostructures and Biomaterials*  
**Aitziber Cortajarena**, BioGune; San Sebastian, Spain
- 2:05 - 2:35 p.m. *Protein Materials: From Nature to Nanotechnology*  
**Tijana Grove**, Virginia Tech; Virginia, United States
- 2:35 - 2:50 p.m. *Collagen Architecture Regulates the Specificity of Interactions with its Receptors*  
**Cody Hoop**, Rutgers University; New Jersey, United States

### Coffee Break I 2:50 - 3:15 p.m. | Gloucester

- 3:15 - 3:45 p.m. *Repetitive Proteins on the Surface of Gram-Positive Bacteria*  
**Jennifer Potts**, University of York, England, UK
- 3:45 - 4 p.m. *Evolution of Environmentally-Enforced, Repeat Protein Topology in the Outer Membrane*  
**Joanna Slusky**, University of Kansas; Kansas, United States
- 4 - 4:30 p.m. *Extensible Protein Scaffolds Based on Beta Solenoids*  
**James Murray**, Imperial College, London; England, UK

## CONCURRENT AFTERNOON SESSION 8

Protein Engineering for Genome Engineering  
1:30 - 4:30 p.m. | Salon F

- 1:30 - 1:35 p.m. *Introduction from Chair*  
**James Moody**, Brigham Young University, Utah, United States
- 1:35 - 2:05 p.m. *Evolutionary Outcomes of CRISPR-anti-CRISPR Conflict*  
**Blake Wiendenheft**, Montana State University; Montana, United States
- 2:05 - 2:35 p.m. *Talk Title To Be Determined*  
**Keith Joung**, Massachusetts General Hospital; Massachusetts, United States
- 2:35 - 2:50 p.m. *Structural Insights into CRISPR and Anti-CRISPR Systems for Precise Genome Editing*  
**Fuguo Jiang**, University of California Berkeley; California, United States

### Coffee Break I 2:50 - 3:15 p.m. | Gloucester

- 3:15 - 3:45 p.m. *CRISPR-Cas Mediated Cleavage of Invading Nucleic Acids*  
**Yanli Wang**, Institute of Biophysics, Chinese Academy of Sciences; Beijing, China
- 3:45 - 4 p.m. *Re-Targeting a Bacterial Assassin: Engineering Plyc Specificity Using Directed Evolution*  
**Sebastian Broendum**, Monash University; Melbourne, Australia
- 4 - 4:30 p.m. LORNE Exchange Speaker  
*Evolution of an Enzyme from a Solute-Binding Protein*  
**Colin Jackson**, Australian National University; Canberra, Australia

## POSTER PRESENTATIONS, EXHIBITS, MIX & MINGLE

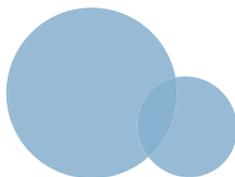
4:30 - 6:30 p.m. | Gloucester

### MENTORING PANEL

6:45 - 7:45 p.m. | Salon E



# PROGRAM



## DAY 3 - WEDNESDAY, JULY 11, 2018

### CONCURRENT MORNING SESSION 9

**Proteostasis: From Midlife Crisis to the Death of Proteins**  
8:30 - 11:45 a.m. | Salon E

- 8:30 - 8:35 a.m. *Introduction from Chair*  
**Meghan Breen**, University of Michigan;  
Michigan, United States
- 8:35 - 9:05 a.m. *Substrate Processing, Conformational Changes, and Mechano-Chemical Coupling of the 26S Proteasome - a Fine-Tuned Molecular Machine*  
**Andreas Martin**, University of California Berkeley;  
California, United States
- 9:05 - 9:35 a.m. *The Ups and Downs of Protein Expression Regulation*  
**Christine Vogel**, New York University; New York,  
United States
- 9:35 - 9:50 a.m. *The HECT C-terminal Lobe of HERC6 Reveals a Unique Autoinhibitory Domain Swapping Mechanism*  
**Donald Spratt**, Clark University;  
Massachusetts, United States

### COFFEE BREAK | 9:50 - 10:15 a.m. | Gloucester

- 10:15 - 10:45 a.m. *Dual Chaperone Function in Nascent Protein Folding*  
**Christian Kaiser**, Johns Hopkins University;  
Maryland, United States
- 10:45 - 11:15 a.m. *How the Proteasome Selects its Targets for Destruction*  
**Andreas Matouschek**, University of Texas, Austin;  
Texas, United States
- 11:15 - 11:45 a.m. *Structural Biology in Cellular Environments Using High Sensitivity nmr*  
**Kendra Frederick**, UT Southwestern;  
Texas, United States

### CONCURRENT MORNING SESSION 10 Multiplexed Protein Science: Deep Mutational Scanning & Applications 8:30 - 11:45 a.m. | Salon F

- 8:30 - 8:35 a.m. *Introduction from Chair*  
**Kathryn McMenimen**, Mt. Holyoke College;  
Massachusetts; United States
- 8:35 - 9:05 a.m. *Talk Title To Be Determined*  
**Deborah Marks**, Harvard University;  
Massachusetts, United States
- 9:05 - 9:35 a.m. *Using Next Generation Sequencing to Engineer Protein-based Therapeutics*  
**Christian Cunningham**, Genentech, California,  
United States
- 9:35 - 9:50 a.m. *Broad Mutational Scanning Across Protein Families*  
**Calin Plesa**, UCLA; California, United States

### COFFEE BREAK | 9:50 - 10:15 a.m. | Gloucester

- 10:15 - 10:45 a.m. *Understanding Protein-Protein Interactions Through Comprehensive Mapping of Binding Landscapes*  
**Julia Shifman**, Hebrew University of Jerusalem; Israel
- 10:45 - 11:15 a.m. *Using Deep Mutational Scanning to Probe Protein Function, Structure and Regulation*  
**Doug Fowler**, University of Washington,  
Washington, United States
- 11:15 - 11:45 a.m. *Solving Protein Structure Using Genetics*  
**Jorn Schmiedel**, Centre for Genomic Regulation;  
Barcelona, Spain

### LUNCH

11:45 a.m. - 1:30 p.m.

Noon - 1:00 p.m. | Wiley Publisher's Workshop | Arlington Room

11:45 a.m. - 1:30 p.m. | Exhibitor Workshop - Wyatt Technology Corp. | St. Botolph

11:45 a.m. - 1:30 p.m. | Exhibitor Workshop - Nicoya Lifesciences | Berkeley

12:15 - 1:30 p.m. | Undergraduate Research Session | Harvard Room



# PROGRAM

DAY 3 - WEDNESDAY, JULY 11, 2018 (CONT.)

PLENARY AWARDS SESSION  
1:30 - 5:30 p.m. | Salons E & F

- 1:30 - 1:35 p.m. *Introduction from The Protein Society President*  
**Charles L. Brooks III**, University of Michigan
- 1:35 - 1:40 p.m. *Presentation of the Dorothy Crowfoot Hodgkin Award*  
(Sponsored by Rigaku)
- 1:40 - 2:10 p.m. *Protein Folding - On and Off the Ribosome*  
2018 Dorothy Crowfoot Hodgkin Award Winner  
**Susan Marqusee**, University of California, Berkeley;  
California, United States
- 2:10 - 2:15 p.m. *Presentation of the Carl Brändén Award*  
(Sponsored by Genentech)
- 2:15 - 2:45 p.m. *Exploring the Wilds of Structural Biology:  
Details, Principles, and Tools*  
2018 Carl Brändén Award Winner  
**Jane and Dave Richardson**, Duke University;  
North Carolina, United States
- 2:45 - 2:50 p.m. *Presentation of the 2018 Christian B. Anfinsen Award*
- 2:50 - 3:20 p.m. *Single Particle Cryo-EM of Membrane Protein in Lipid  
Nanodisc*  
**Yifan Cheng**, University of California San Francisco;  
California, United States

COFFEE BREAK | 3:20 - 3:45 p.m. | Gloucester

- 3:45 - 3:50 p.m. *Presentation of the Emil Thomas Kaiser Award 3:50 -*
- 3:50 - 4:20 p.m. *Biological Phase Separations: Mechanisms, Regulation  
and Function*  
2018 Emil Thomas Kaiser Award Winner  
**Michael Rosen**, University of Texas Southwestern  
Medical School; Texas, United States
- 4:20 - 4:25 p.m. *Presentation of the Protein Science Young Investigator  
Award (Sponsored by Wiley)*
- 4:25 - 4:55 p.m. *Structural Biology in the Gas Phase: New Techniques  
for the Rapid Analysis of Protein Sequence, Structure  
and Stability*  
**Brandon Ruotolo**, University of Michigan; Michigan,  
United States
- 4:55 - 5:05 p.m. *Presentation of The Protein Society Service Awards*
- 5:05 - 5:30 p.m. *Presentation of Hans Neurath Outstanding Promise  
Travel Awards*

POSTERS OPEN, EXHIBITS, MIX & MINGLE  
5:30 - 7:30 p.m. | Gloucester

MEMBERS' RECEPTION (*all welcome*)  
8:30 - 10:30 p.m. | Salon F  
*Presentation of the Best Poster Competition Winners*

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# PROGRAM

DAY 4 - THURSDAY, JULY 12, 2018

**CONCURRENT MORNING SESSION 11**  
**Phase Transitions and Mesoscale Structure**  
**8:30 - 10:35 a.m. | Salon E**

- 8:30 - 8:35 a.m. *Introduction from Chair*  
**Jamie Towle-Weicksel**, Rhode Island College;  
Rhode Island; United States
- 8:35 - 9:05 a.m. *Disease Mutations and Post-Translational Modifications*  
*Alter Disordered Protein Liquid-Liquid Phase Separation*  
**Nicolas Fawzi**, Brown University;  
Rhode Island, United States
- 9:05 - 9:35 a.m. *RNA Structure Encodes Specificity in a PolyQ Protein Phase Separation*  
**Amy Gladfelter**, University of North Carolina;  
North Carolina, United States
- 9:35 - 9:50 a.m. *Mechanism and Consequences of Reentrant Phase*  
*Transition of Intrinsically Disordered Proteins*  
**Priya Banerjee**, University at Buffalo, SUNY;  
New York, United States
- 9:50 - 10:20 a.m. *Complex Phenotypic Landscape of a Simple Phase-*  
*Separated Protein System*  
**Emmanuel Levy**, Weizmann Institute of Science;  
Rehovot, Israel

**CONCURRENT MORNING SESSION 12**  
**Beyond 20 Amino Acids: Unnatural Mutagenesis**  
**8:30 - 10:35 a.m. | Salon F**

- 8:30 - 8:35 a.m. *Introduction from Chair* **Denise**  
**Okafor**, Emory University;  
Georgia; United States
- 8:35 - 9:05 a.m. *Repurposing Ribosomes for Synthetic Biology*  
**Mike Jewett**, Northeastern University; Massachusetts,  
United States
- 9:05 - 9:35 a.m. *The RaPID Way to Discover Bioactive Pseudo-Natural*  
*Peptides With Macrocyclic Scaffold*  
**Hiroaki Suga**, University of Tokyo and Peptidream;  
Tokyo, Japan

## DAY 4 - THURSDAY, JULY 12, 2018 (CONT.)

- 9:35 - 9:50 a.m. *Fluorescent Sensors for Detection of Protein*  
*Carbonylation*  
**Kamalika Mukherjee**, Massachusetts General Hospital,  
Harvard University; Massachusetts, United States
- 9:50 - 10:20 a.m. *Genomically Recoded Organisms: Living Foundries for*  
*Producing Genetically-Encoded Materials*  
**Farren Isaacs**, Yale University;  
Connecticut, United States
- COFFEE BREAK | 10:20 - 10:50 a.m. | Foyer**  
**CLOSING PLENARY and 2018 STEIN & MOORE AWARD**  
**10:50 a.m. - 11:45 a.m.**  
**Salon E**
- 10:50 - 10:55 a.m. *Introduction from The Protein Society President and*  
*Presentation of the Stein & Moore Award Winner*  
**Charles L Brooks III**, University of Michigan
- 10:55 - 11:25 a.m. *A New Approach Towards Diabetes Drug Discovery*  
*2018 Stein & Moore Award Winner*  
**Raymond Stevens**, University of Southern California;  
California, United States
- 11:25 - 11:45 a.m. *Closing Remarks from The Protein Society President*  
**Charles L. Brooks III**, University of Michigan