

Biophysics in the Big Easy

Biophysical Society 61ST Annual Meeting

February 11–15, 2017 • New Orleans, Louisiana

Program



Biophysical Society

MONDAY LATE POSTERS

1:45 PM–3:45 PM, HALL B-2 & C

All abstracts are available through the desktop planner and mobile app.

Posters should be mounted beginning at 6:00 PM on Sunday and removed by 5:30 PM on Monday evening. Posters will be on view until 10:00 PM the night before presentation. Board numbers indicate where boards are located in the Exhibit Hall.

Late posters are to be placed on boards beginning with "L".
These boards are located on the right-hand side of the Exhibit Hall.

ODD-NUMBERED BOARDS 1:45 PM–2:45 PM | EVEN-NUMBERED BOARDS 2:45 PM–3:45 PM

Board Numbers	Category
Board LB1–LB6	Protein Structure and Conformation II
Board LB7–LB9	Protein Folding: Dynamics and Novel Methods
Board LB10–LB13	Protein Assemblies I
Board LB14–LB16	Protein Dynamics and Allostery II
Board LB17	Membrane Protein Folding
Board LB18–LB21	Intrinsically Disordered Proteins (IDP) and Aggregates I
Board LB22	Transcription
Board LB23–LB25	Chromatin and the Nucleoid
Board LB26–LB28	Membrane Structure II
Board LB29–LB31	Protein-Lipid Interactions: Channels
Board LB32–LB35	General Protein-Lipid Interactions II
Board LB36–LB38	Intracellular Calcium Channels and Calcium Sparks and Waves
Board LB39–LB42	Cardiac, Smooth, and Skeletal Muscle Electrophysiology I
Board LB43	Muscle Regulation
Board LB44–LB45	Intracellular Transport
Board LB46–LB47	Voltage-gated Na Channels II
Board LB48–LB49	Voltage-gated K Channels and Mechanisms of Voltage Sensing and Gating II
Board LB50–LB52	TRP Channels II
Board LB53–LB55	Ion Channel Regulatory Mechanisms
Board LB56–LB58	Cardiac Muscle Regulation
Board LB59–LB62	Kinesins, Dyneins, and Other Microtubule-based Motors I
Board LB63–LB69	Myosins
Board LB70–LB74	Cell Mechanics, Mechanosensing, and Motility II
Board LB75–LB77	Transporters and Exchangers II
Board LB78–LB81	Cellular Signaling and Systems Biology
Board LB82–LB85	Neuroscience: General, Computational, and Experimental Approaches II
Board LB86–LB89	Molecular Dynamics II
Board LB90–LB94	Computational Methods and Bioinformatics I
Board LB95–LB97	Optical Microscopy and Super-Resolution Imaging: Novel Approaches and Analysis II
Board LB98–LB100	Single-Molecule Spectroscopy II
Board LB101–LB104	Micro- and Nanotechnology II
Board LB105–LB106	Bioengineering

It is the responsibility of the poster presenters to remove print materials from the board after their presentations. Please do not leave materials or belongings under poster boards or in the poster area. Posters will not be collected or stored for pick-up at a later time. The Biophysical Society is not responsible for any articles left in the poster area.

L3370-Pos Board LB25

REGULATION OF NUCLEOSOME STACKING AND CHROMATIN COMPACTIFICATION BY INTERACTION BETWEEN THE H4 N-TERMINAL TAIL AND THE H2A ACIDIC PATCH. **Lars Nordenskiöld**, Qinming Chen, Renliang Yang, Nikolay Korolev, Chuan Fa Liu

Membrane Structure II (Boards LB26 - LB28)

L3371-Pos Board LB26

PREPARATION OF ASYMMETRIC VESICLES USING A SOLUBLE PHOSPHATIDYL SERINE DECARBOXYLASE OR CYCLODEXTRINS. **Carina Zorzin**, Marie Markones, Sebastian Fiedler, Dennis Voelker, Rolf Schubert, Heiko Heerklotz

L3372-Pos Board LB27

SPATIALLY RESOLVING THE CONDENSING EFFECT OF CHOLESTEROL ON PHOSPHOLIPIDS. **Felix Leeb**, Lutz Maibaum

L3373-Pos Board LB28

CURVATURE-MEDIATED EFFECTS IN TOPOGRAPHICALLY TUNABLE LIPID BILAYERS. **Rana Ashkar**, Jan-Michael Carrillo, Mikhail Zhernenkov, Ryan Toomey, Roger Pynn, John Katsaras, Bobby Sumpter

Protein-Lipid Interactions: Channels (Boards LB29 - LB31)

L3374-Pos Board LB29

A SOLUBLE FLUORESCENT PIP₂ ASSAY FOR TREK-1, A LIPID-GATED ION CHANNEL. **Cerrone S. Cabanos**, Arman Nayeboadri, Scott B. Hansen

L3375-Pos Board LB30

STRONG EVIDENCE FOR A MEMBRANE-MEDIATED COMPONENT OF POSTSYNAPTIC NEUROTRANSMISSION: KINETIC ANALYSIS OF GABAAR ELECTROPHYSIOLOGY AND THE MOLECULAR MECHANISM OF ANESTHESIA. **Robert Cantor**

L3376-Pos Board LB31

THE EFFECTS OF MGR2 ON HYDROPHOBICITY THRESHOLD FOR TRANSMEMBRANE HELIX INSERTION INTO THE MITOCHONDRIAL INNER MEMBRANE. **Suji Yoo**, Seoun Lee, Hyun Kim

General Protein-Lipid Interactions II (Boards LB32 - LB35)

L3377-Pos Board LB32

SINGLE-MOLECULE PEPTIDE-LIPID AFFINITY ASSAY REVEALS ENERGETIC LANDSCAPE OF AN INTERACTION INVOLVED WITH PROTEIN EXPORT IN E. COLI. Tina R. Matin, Krishna P. Sigdel, Milica Utjesanovic, Brendan P. Marsh, Fabio Gallazzi, Virginia F. Smith, Ioan Kosztin, **Gavin King**

L3378-Pos Board LB33

ROLE OF FISB-CARDIOLIPIN INTERACTIONS IN MEMBRANE FISSION DURING SPORULATION IN BACILLUS SUBTILIS. **Martha Braun**, Ane Landajuela, Erdem Karatekin

L3379-Pos Board LB34

A LABEL-FREE STUDY OF MEMBRANE PROTEIN INTERACTION KINETICS ON SINGLE CELLS. **Nguyen (Win) Ly**

L3380-Pos Board LB35

MECHANISMS OF PI(3,4,5)P₃ HYDROLYSIS BY PTEN. **Chun Liu**

Intracellular Calcium Channels and Calcium Sparks and Waves (Boards LB36 - LB38)

L3381-Pos Board LB36

BLOCKING MITOCHONDRIAL CA²⁺ UNIporter REVEALS EVIDENCE FOR CA²⁺/H⁺ EXCHANGE. **Christopher D. Navarro**, Michael R. Boswell, Ariea D. Davani, James S. Heisner, Amadou K.S. Camara, David F. Stowe

L3382-Pos Board LB37

MATRIX CA²⁺ REGULATION OF MITOCHONDRIAL UNIporter (MCU) ACTIVITY DEPENDS ON MATRIX CA²⁺ BUFFERING CAPACITY: A REGULATORY ROLE FOR CA²⁺ FLUX THROUGH MCU? **Horia Vais**, Don-On Daniel Mak, J. Kevin Foskett

L3383-Pos Board LB38

MICU PROTEIN GATEKEEPING OF MCU IN RESTING CYTOPLASMIC [CA²⁺]. **Riley Payne**, Henry Hoff, Anne Roskowsky, J. Kevin Foskett

Cardiac, Smooth, and Skeletal Muscle Electrophysiology I (Boards LB39 - LB42)

L3384-Pos Board LB39

INTERSTITIAL EDEMA DISRUPTS STRUCTURE AND ELECTRICAL ACTIVITY OF CARDIAC T-TUBULE SYSTEM. **Danila Bobkov**, Andrey Stepanov, Ekaterina Baydyuk, Przemyslaw Radwanski, Galina Sakuta, Sandor Gyorke, Igor Kubasov

L3385-Pos Board LB40

CELL POPULATION INFLUENCES ON CARDIAC OPTICAL PACING. **Franziska Schneider**, Callum Johnston, Eva Rog-Zielinska, Gunnar Seemann, Urszula Siedlecka, Peter Kohl

L3386-Pos Board LB41

CARDIAC-SPECIFIC OVEREXPRESSION OF RELAXIN-2 SUPPRESSES ARRHYTHMIAS BY INCREASING MYOCARDIAL CONDUCTION RESERVE. **Benjamin Strauss**, Lukas Motloch, Jun Hu, Fadi G. Akar

L3387-Pos Board LB42

REGIONAL DIFFERENCES IN FAST AND SLOWLY RECOVERING TRANSIENT OUTWARD K⁺ CURRENT (I_{TO}) UNDERLIE EARLY AFTERDEPOLARIZATIONS (EAD) IN TRANSGENIC RABBIT MODEL OF LONG QT SYNDROME TYPE 1 (LQT1). **Anatoli Kabakov**, Colin Rees, Taeyun Kim, Radmila Terentyeva, Karim Roder, Zhilin Qu, Dmitry Terentyev, Alain Karma, Bum-Rak Choi, Gideon Koren

Muscle Regulation (Board LB43)

L3388-Pos Board LB43

MOLECULAR BASIS OF A NEWLY IDENTIFIED RECESSIVE *TNNI1* MYOPATHY. **Anupom Mondal**, Han-Zhong Feng, Rong Liu, Wang Hui, J-P Jin

Intracellular Transport (Boards LB44 - LB45)

L3389-Pos Board LB44

EXPLORING THE KINETICS OF THE COPII GTPASE SAR1. **Mona Grimmer**, Matthias P. Mueller, Roger S. Goody, Kirsten Bacia

L3390-Pos Board LB45

THE ROLE OF THE SIGNAL PEPTIDASE COMPLEX ON THE RECOGNITION OF TRANSLOCATING POLYPEPTIDES IN THE ENDOPLASMIC RETICULUM MEMBRANE. **Chewon Yim**, Hyun Kim

Voltage-gated Na Channels II (Boards LB46 - LB47)

L3391-Pos Board LB46

A NONBLOCKING MODULATOR ACTION OF RILUZOLE ON SODIUM CHANNELS. **Arpad Mike**, Krisztina Pesti, Anett K. Szabo, Matyas C. Földi, Peter Lukacs

L3392-Pos Board LB47

UNFOLDING OF A TEMPERATURE SENSITIVE DOMAIN CONTROLS VOLTAGE GATED CHANNEL ACTIVATION. **Cristina Arrigoni**, Ahmed Rohaim, David Shaya, Felix Findeisen, Richard A. Stein, Hassane S. Mchaourab, Daniel L. Minor Jr.

The Role of the Signal Peptidase Complex on the Recognition of Translocating Polypeptides.

Chewon Yim and Hyun Kim

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The Sec61 translocon accommodates ER-targeted polypeptides including membrane proteins and secretory proteins in its pore for their ER translocation. Most membrane proteins are targeted to the endoplasmic reticulum (ER) by the first hydrophobic transmembrane (TM) segment whereas secretory proteins have an N-terminal signal sequence for ER targeting. TM domains and signal sequences share similar sequence context, target the whole polypeptide to the ER, and locate near to the lateral gate of the Sec translocon during translocation. The conventional view on the translocation event has not distinguished these two different types of sequences in much detail.

One of the most distinctive features of signal sequences is that they are removed upon ER entry, recognized and cleaved by the signal peptidase complex (SPC). Nevertheless, cleavage site in the C-terminus of signal sequences are of broad range and loose requisite in amino acid sequences. The SPC needs to distinguish a cleavable N-terminal signal sequence from a signal anchor sequence, the underlying mechanism of which is unknown.

This study aims to elucidate the key players involved in the recognition and categorization of ER-targeted polypeptides. We recently observed that model membrane proteins with a putative SPC-mediated cleavage site were more efficiently cleaved in the absence of Spc1p or Spc2p, the non-essential subunits of the SPC. Based on the assumption that translocating nascent chains must be either recognized for or discriminated from being subjected to the SPC cleavage activity, these data suggest that Spc1p/Spc2p may be involved in the regulation of the recognition of the substrates for proper processing by the SPC. Further, deletion of Spc2p resulted in fluctuation in the translocation of ER-targeted proteins, newly suggesting its role on protein translocation.