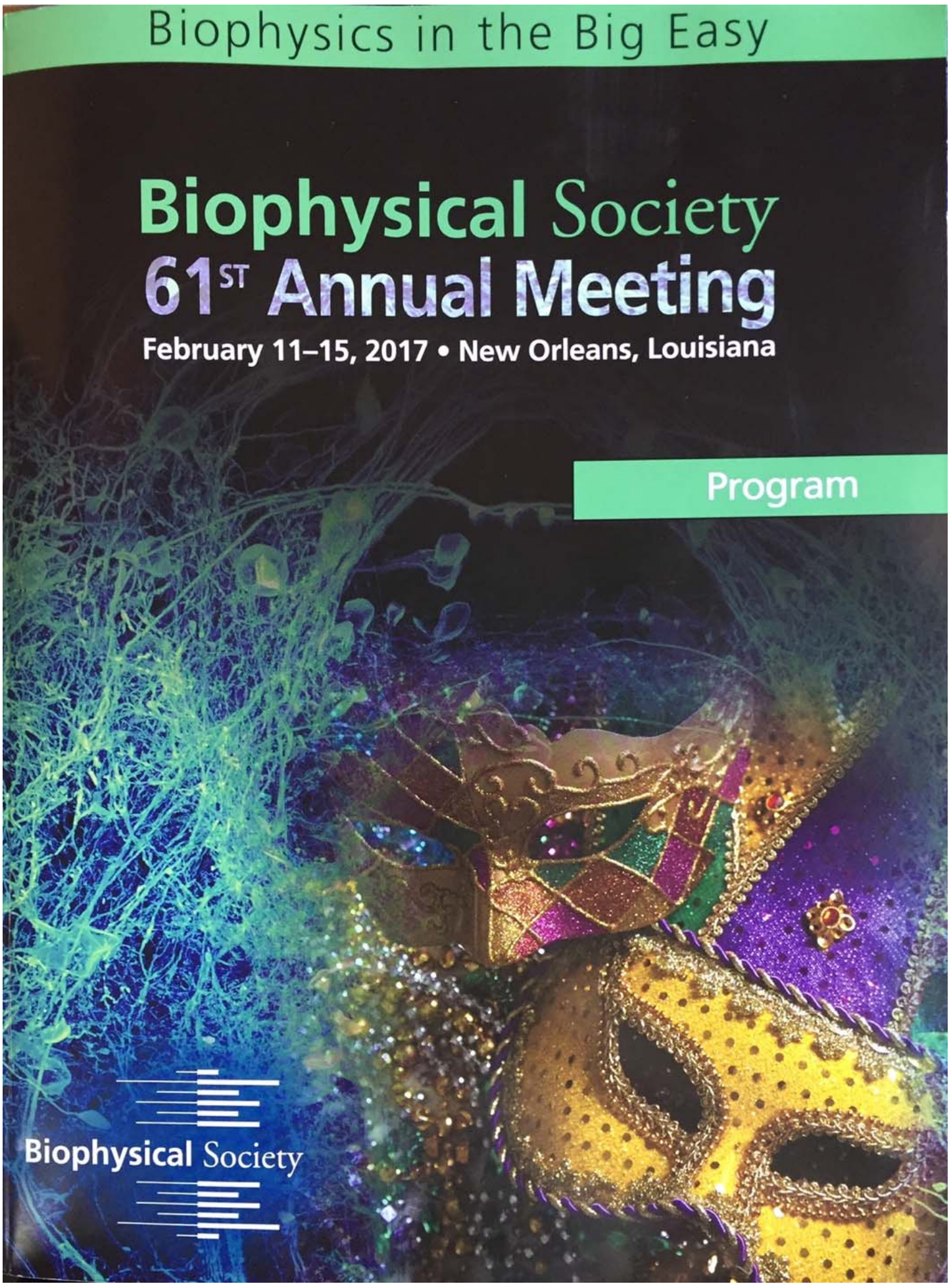
Biophysics in the Big Easy

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 Bioinformantics 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 Nanotechology 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 COMPACTION 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 PHOSPHATIDYLSERINE 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 PIP_2 ASSAY FOR TREK-1, A LIPID-GATED ION CHANNEL. **Cerrone S. Cabanos**, Arman Nayebosadri, 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 CA^{2+} UNIPORTER REVEALS EVIDENCE FOR CA^{2+}/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 CA^{2+} REGULATION OF MITOCHONDRIAL UNIPORTER (MCU) ACTIVITY DEPENDS ON MATRIX CA^{2+} BUFFERING CAPACITY: A REGULATORY ROLE FOR CA^{2+} FLUX THROUGH MCU? **Horia Vais**, Don-On Daniel Mak, J. Kevin Foskett

L3383-Pos **Board LB38**
MICU PROTEIN GATEKEEPING OF MCU IN RESTING CYTOPLASMIC $[CA^{2+}]$. **Riley Payne**, Henry Hoff, Anne Roskowski, 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 *TNNT1* 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 Effects of Mgr2 on Hydrophobicity Threshold for Transmembrane Helix Insertion into the Mitochondrial Inner Membrane

Suji Yoo, Seoun Lee and Hyun Kim

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The majority of integral membrane proteins have tightly packed α-helical transmembrane segment (TMS). The formation of an α-helix and overall hydrophobicity are crucial determinants for translocon-mediated recognition and insertion of a TMS into the lipid bilayer, involving direct interaction between TMS and the surrounding lipid.

While overall hydrophobicity required for TMS insertion into the mitochondrial inner membrane (MIM) is shown comparable to what is required in the endoplasmic reticulum membrane, differences in threshold hydrophobicity and effects of flanking charged residues have been observed (Botelho et al., EMBO J, 2011). What contributes these differences is currently unknown. The TIM23 complex is the main channel for import and inner membrane insertion of presequence containing proteins. The recently identified subunit of TIM23 complex, Mgr2 is reported to act as a lateral gatekeeper to MIM proteins; absence of Mgr2 facilitates membrane insertion while overexpression delays (Ieva et al., Molecular Cell, 2014). This led us to hypothesize that Mgr2 may play a role in screening TMS for membrane insertion. To test this idea, present study has undertaken to systematically determine the effects of Mgr2 on the TIM23-mediated TM helix insertion.

By replacing the 1st TM of Mgm1 with 19 amino acid stretch composed of *n* leucines and 19-*n* alanines (from 1L to 8L), we analyzed membrane insertion efficiency of Leu/Ala segments of various hydrophobicity. The relative amounts of *l*-Mgm1 (which is the 1st TM inserted form) increased with higher number of leucines. While 50% membrane insertion reached for $n \fallingdotseq 5$-6 in WT, this hydrophobicity threshold is decreased to $n \fallingdotseq 4$-5 when Mgr2 was deleted and increased to $n \fallingdotseq 6$ upon overexpression of Mgr2. These data suggest that Mgr2 is involved in modulating the TM helix insertion efficiency in the mitochondrial inner membrane.