**KEYSTONE SYMPOSIA**

**AAA+ Proteins: From Atomic Structures to Organisms (A5)**

**January 26-29, 2020 • Granlibakken Tahoe • Tahoe City, CA, USA**

Scientific Organizers: Walid A. Houry, James Shorter, Antonina Roll-Mecak and Phyllis I. Hanson

Supported by the Directors’ Fund

Discounted Abstract & Scholarship Deadline: September 26, 2019 / Abstract Deadline: November 6, 2019 / Discounted Registration Deadline: November 21, 2019

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**SUNDAY, JANUARY 26**

Arrival and Registration

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**MONDAY, JANUARY 27**

**Welcome and Keynote Address**

*Wald A. Houry, University of Toronto, Canada*

*James Shorter, University of Pennsylvania, USA*

*Antonina Roll-Mecak, DHHS/NIH/NINDS, USA*

*Phyllis I. Hanson, University of Michigan, USA*

**Bob T. Sauer, Massachusetts Institute of Technology, USA**

*Is ClpXP Unique or a Model for Other AAA+ Proteases and Protein Remodelers?*

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**Insights into AAA+ Mechanism of Function by CryoEM**

*Antonina Roll-Mecak, DHHS/NIH/NINDS, USA*

**Daniel Southworth**, University of California, San Francisco, USA

**Structures and Mechanisms of Protein Unfolding Machines by Cryo-EM**

*Axel T. Brunger, Stanford University, USA*

**SNARE Complex Recycling and Quality Control by the AAA+ NSF ATPase**

*Andreas Martin, University of California, Berkeley, USA*

**Mechanisms of ATPase-Coupled Substrate Translocation by the 26S Proteasome and Related AAA+ Motors**

**Carol Soomin Cho, Korea Advanced Institute of Science and Technology, South Korea**

**Short Talk: Nucleotide-Dependent Structural Changes of the Abo1 AAA+ Histone Chaperone**

*Steven E. Glynn, Stony Brook University, USA*

**Short Talk: Structure of the AFG3L2 Mitochondrial AAA+ Protease Reveals the Molecular Basis for Activity in Health and Disease**

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**Workshop 1**

*Phyllis I. Hanson, University of Michigan, USA*

**Kevin D. Corbett, University of California, San Diego, USA**

**Regulation of a Bacterial Innate-Immune Pathway by a TRIP13-Like ATPase**

**Ryan R. Cupo, University of Pennsylvania, USA**

**Function of Skd3, a Mitochondrial AAA+ Protein**

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**Stephanie Gates**, University of California, Berkeley, USA

**VCP/p97 N-Terminal Domain Conformational Switching Regulates Cofactor Binding and Substrate Processing**

**Irina Gutsche**, Institut de Biologie Structurale, France

**An Enterobacterial Stress Response Triad from a Cryo-EM Perspective**

**Julia Kardon**, Brandeis University, USA

**Directed Unfolding by Mitochondrial ClpX Controls an Essential Biosynthetic Enzyme**

**Saikrishnan Kayarat**, Indian Institute of Science Education and Research, India

**Mechanism of Activation of the AAA+ GTPase McrB by the Endonuclease McrC**

**Teru Ogura**, IMEG, Kumamoto University, Japan

**Function of the p97-20S Proteasome and Nanodynamics of Novel and Canonical Proteasomal Pathway Components**

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**AAA+ Proteins of the Cytoskeleton**

*James Shorter, University of Pennsylvania, USA*

**Antonina Roll-Mecak, DHHS/NIH/NINDS, USA**

**Mechanism and Regulation of Microtubule Severing Enzymes**

**David W. Ehrhardt, Stanford University, USA**

**Mechanisms of Acentrosomal Microtubule Array Organization in Higher Plants**

**Arne Gennerich**, Albert Einstein College of Medicine, USA

**Short Talk: Force Generation of Mammalian Dynnein-Dynactin is Augmented by Lis1**

**Chun-che Tseng**, Mayo Clinic Graduate School of Biomedical Sciences, USA

**Short Talk: Conserved Regulation of AAA-ATPase Vps4 by V Domain of Bro1 Family Proteins Contributes to ESCRT-III Function**

**Poster Session 1**

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**TUESDAY, JANUARY 28**

**Role of AAA+ Proteins in Cellular Remodeling**

*Teru Ogura, IMEG, Kumamoto University, Japan*

**Chemical Probes for AAA+ Proteins**

**Conrad C. Weihl**, Washington University School of Medicine, USA

**Multisystem Proteinopathy Mutations Define New Functions for p97/VCP ATPase**

**James H. Hurley**, University of California, Berkeley, USA

**Roles of VPS4 and Spastin in ESCRT-III Membrane Scission and Disassembly**

**Xiaodong Zhang**, Imperial College London, UK

**Mechanistic Insights into Non-Translocating AAA ATPases: From INO80 Chromatin Remodeller to Transcription Activators**

**Aaron L. Lucius**, University of Alabama at Birmingham, USA

**Short Talk: Falling Off: ClpB and Hsp104 Operate as Non-Processive Translocases**

**Zev A. Ripstein**, Hospital for Sick Children, Canada

**Short Talk: A Processive Rotary Mechanism Couples Substrate Unfolding and Proteolysis in the ClpXP Degradation Machinery**

**Role of AAA+ Proteins in Regulating DNA and RNA Complexes**

*Andreas Martin, University of California, Berkeley, USA*

**Robin E. Stanley**, NIEHS, National Institutes of Health, USA

**Role of AAA-ATPases in Ribosome Assembly**

**James M. Berger**, Johns Hopkins University School of Medicine, USA

**Conformational Coupling and Substrate-Recognition Plasticity in Replicative AAA+ ATPases**

**Matt J. Jaremko**, Cold Spring Harbor Laboratory, USA

**Short Talk: The Dynamic Conformations of the Human Origin Recognition Complex**
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**AAAN Proteins in Disease Pathways**

* Arne Gennerich, Albert Einstein College of Medicine, USA
  Role of the ClpXP Protease in Pathogenesis

* Walid A. Houry, University of Toronto, Canada
  How Torsins Regulate Cellular Lipid Metabolism

* Christopher P. Hill, University of Utah, USA
  Translocation Mechanism of AAA Unfoldsases

* Tania A. Baker, Massachusetts Institute of Technology, USA
  Are Two Rings Better than One? Deciphering Roles of the ATPase Modules in the Double Ring AAA+ Unfoldase ClpA

* Daisuke Morito, Showa University, Japan
  Short Talk: The 591 kDa AAA+/Ubiquitin Ligase Regulates the Cellular Fat Metabolism

* Nina Marie Wolf, University of Illinois, Chicago, USA
  Short Talk: Structures of ClpC1 from Mycobacterium Tuberculosis in Complex with Macrocyclic Inhibitors from Natural Products Reveal Critical Binding Interactions

* Minglei Zhao, University of Chicago, USA
  Short Talk: Mechanistic Insights into p97 Inhibition through Disulfiram Derivative

**Workshop 2**

* Xiaodong Zhang, Imperial College London, UK
  Conformational Plasticity of the ClpAP AAA+ Protease Couples Protein Unfolding and Proteolysis

* Ying Lu, Harvard Medical School, USA
  An Empirical Free-Energy Landscape Reveals the Global Conformational Dynamics of Proteasomal ATPases

* Wen Ma, University of California, San Diego, USA
  Molecular Mechanism of Polypeptide Translocation by an AAA+ Unfoldase Studied by Long Timescale Atomistic Simulations

* Oliver Mueller-Cajar, Nanyang Technological University, Singapore
  Insights into the Mechanism and Regulation of the CbbQO-type Rubisco Activase, a MoxR AAA+ ATPase

* Thomas U. Schwartz, Massachusetts Institute of Technology, USA
  On the Unusual Assembly States of the AAA+ ATPase TorsinA

* Mia Shin, The Scripps Research Institute, USA
  Structural Basis for Distinct Operational Modes and Protease Activation in Lon Protease

* David Smith, West Virginia University School of Medicine, USA
  Functional and Regulatory Roles Played by the N-Domain of the Proteasomal ATPase PAN

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**AAA+ Proteins and Therapeutics**

* James Shorter, University of Pennsylvania, USA
  AAA+ Disaggregases as Therapeutic Agents

* Phyllis I. Hanson, University of Michigan, USA
  Role of AAA+ Protein in Late Endosomes

* Meeting Wrap-Up: Outcomes and Future Directions (Organizers)
  THURSDAY, JANUARY 30
  Departure

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* Session Chair † Invited but not yet accepted     Program current as of February 27, 2020. Program subject to change. Meal formats are based on meeting venue. For the most up-to-date details, visit https://www.keystonesymposia.org.