**All sessions in Peninsula I & II**

**(please note this is the usual room on the same floor as the hotel lobby near the entrance)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Thursday Afternoon, May 2, 2024** | | | | |
| 16:00 -16:15 | Introduction and Welcome  to Cabo XXXII | | Ian Wilson and Andrej Šali |
| **16:15-17:20** | **Short Presentations (4 + 1 min.) by TSRI Graduate Students**  **(Chair: Keren Lasker, TSRI)** | | |
|  | Nathan Beutler | TSRI | Beyond binding: Unraveling the complex dance of antibodies with native CSP on Plasmodium sporozoites |
|  | André Nicolás León | TSRI | Mapping pediatric antibody responses to influenza hemagglutinin and neuraminidase |
|  | Daniel Lima Vilela Bader | TSRI | New targets for HIV vaccine design |
|  | Xiaohe Lin | TSRI | Computational and structural evaluation of the immune response for HIV vaccine design and development |
|  | Olivia Swanson | TSRI | Machine Learning method enhances immunogen development to escape local design minima |
|  | Colleen Maillie | TSRI | Engineering de novo transmembrane adaptor molecules for regulating Toll-like Receptor 4 |
|  | Michaela Medina | TSRI | Investigating mitochondrial membrane ultrastructure during chronic ER stress |
|  | David Lanster | TSRI | Rubisco directed evolution for efficient CO2 fixation |
|  | Ariana Sulpizio  Althea Hansel-Harris | TSRI  TSRI | Elucidating ligand-dependent differences in STING activation  Incorporation of experimental structural density in AutoDock improves success rate across docking applications and targets |
|  | Camille Rubel | TSRI | Electroreductive preparation of Ni(0) complexes |
|  | Jenna Tom | TSRI | Organization and dynamics in anionic biopolymer condensates across scales |
|  | Dominique Carey | TSRI | Mechanism of action of A205804 in endothelial cells |
| 17:20-17:35 | **Break** |  |  |
| **17:35-18:35** | **Short Presentations (4 + 1 min.) by UCSF Graduate Students and Postdocs**  **(Chair: Keren Lasker, TSRI)** | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | José Montaño | UCSF | | Platforms to improve and profile covalent inhibitor selectivity | | |
|  | Jonathan San Felipe | UCSF | | Developing a biophysical model for the Orf9b-Tom70 equilibrium | | |
|  | Leah Shaffer | UCSF | | A multi-scale map of proteome organization from integration of protein interactions and images | | |
|  | Lee Schnaider | UCSF | | Probing the rules of protein structure, function and recognition through the de novo design of functional protein | | |
|  | Neelesh Soni | UCSF | | Integrative modeling of the nuclear pore complex basket | | |
|  | Hayarpi Torosyan | UCSF | | Capturing the dynamic activation of PI3Kα on membranes using cryo-EM | | |
|  | Maxwell Tucker | UCSF | | Visualizing VCP/p97 recruitment to damaged lysosomes by cryo-electron tomography | | |
|  | Nicholas Young | UCSF | | Dissecting quantitative protease drug resistance landscapes in high-throughput | | |
|  | Dominic Grisingher  Lieza Chan  Jonathan Sandoval | UCSF  UCSF  UCSF | | Designing de novo proteins with two conformational states  Visualizing a therapeutic antibody engaging the Sotorasib-modified KRAS G12C MHC I complex by cryo-EM  Reconstitution and pharmacological disruption of chromatin-associated oncogenic condensates | | |
| 18:35 | **Break** |  | |  | | | |
| **18:50– 20:10** |  | | **Condensates** | | | **(Chair: Howard Hang, TSRI)** | |
| 18:50 | Ashok Deniz | | TSRI | | Biophysics of condensates, single molecules to mesoscales | |
| 19:10 | Keren Lasker | | TSRI | | Phase dependent binding | |
| 19:30 | Lisa Racki | | TSRI | | Polyphosphate condensates: drivers and passengers of bacterial chromatin dynamics | |
| 19:50 | Danica Galonic Fujimori | | UCSF | | Reconstitution and pharmacological disruption of chromatin-associated oncogenic condensates | |
| **20:30 – 22:30** | **Reception with Buffet**  (open to all including guests) | |  | | | **Poolside (adult pool)** | |

Keynote Lecture

Innovation by Evolution: Bringing New Chemistry to Life

Frances H. Arnold

The most powerful design process ever invented is evolution: it generates incomparable functionality and works at all scales, from molecules to entire ecosystems. There is nothing like it in the world of human engineering. Humans have used evolution for biological design for thousands of years, choosing who mates with whom and who goes on to parent the next generation. We can now use evolution to explore the future of chemistry by engineering the catalysts of life, enzymes. I will describe how we can direct enzyme evolution to solve challenging chemical problems once thought to be out of reach of biology, and even of chemistry.

|  |  |  |  |
| --- | --- | --- | --- |
| **Friday Morning, May 3, 2024 Biophysics and Biology of Cellular Processes I**  **(Chair: Robert Stroud, UCSF)** | | | |
| 08:30 | Helen Berman | UCSF | New resources for nucleic acid structural biology |
| 08:50 | Megan Ken | TSRI | The role of RNA structural dynamics in cellular function and antiviral drug development |
| 09:10 | Gabriel Lander | TSRI | How are DNA microhomologies positioned for double-strand break repair? |
| 09:30 | James Williamson | TSRI | Global perturbation analysis of ribosome assembly |
| 09:50 | **Break** |  |  |
| **Friday Morning, May 3, 2024 Keynote Lecture**  **(Introduction: Ahmed Badran, TSRI)** | | | |
| 10:10  11:10 | Frances H. Arnold  Questions & Discussion | CalTech | Innovation by evolution: bringing new chemistry to life |
| 11:25 | **Break** |  |  |
| **Friday Morning, May 3, 2024 Biophysics and Biology of Cellular Processes II**  **(Chair: Robert Stroud, UCSF)** | | | |
| 11:40 | Danielle Grotjahn | TSRI | Stress-dependent mitochondrial remodeling across scales |
| 12:00 | Luke Wiseman | TSRI | Stress responsive regulation of cellular physiology |
| 12:20 | Daniel Southworth | UCSF | Conformational states and allosteric control mechanisms of AAA+ unfoldase machines |
| 12:40-16:00 | **Break** |  |  |
| **Friday Afternoon, May 3, 2024 Chemistry and Biology**  **(Chair: Travis Young, Calibr-Skaggs)** | | | |
| 16:00 | Ahmed Badran | TSRI | Improving the chemistry of photosynthetic carbon capture |
| 16:20 | Luke Lairson | TSRI | A potent and cell type selective RIPK2-dependent small molecule prodrug for the treatment of brain cancers |
| 16:40 | James Fraser | UCSF | Deep mutational scanning to identify kinase inhibitor resistance mechanisms |
| 17:00 | Sumit Chanda | TSRI | HIV-host interactions |
| **17:20** | **Group photo** |  | Main lobby steps to pools |
| 17:50 | Philip Dawson | TSRI | Building macromolecule conjugates using a different solid phase |
| 18:10 | Michael Erb | TSRI | Organization and dynamics in anionic biopolymer condensates across scales |
| 18:30  18:50 | Shannon Miller  Giordano Lippi | TSRI  TSRI | Next-generation technologies for in vivo genome editing  Beyond transcription - Neuronal mechanisms of gene expression |
| 19:10 | Margaux Pinney | UCSF | Dissecting the adaptive landscape of enzyme catalysis in high-throughput |
| *20:00 – 22:30 Sponsors Dinner, by invitation only – El Agave* | | | |
|  | | | |
| **Saturday Morning, May 4, 2024 Integrative Computational and Structural Biology**  **(Chair:Allison Williams, UCSF)** | | | |
| 08:30  08:50 | Andrej Šali  Trey Ideker | UCSF  UCSD | Integrative modeling  Digital tumors for precision oncology |
| 09:10 | Stefano Forli | TSRI | "Boil em, mash em, stick em in a stew". Cosolvent molecular dynamics for characterization and discovery of protein binding sites |
| 09:30  09:50 | Tanja Kortemme  William Degrado | UCSF  UCSF | De novo design of dynamic proteins guided by deep learning  Protein design |
| 10:10 | **Break** |  |  |
| **Microbial Pathogens and Immune System**  **(Chair: Mark Yeager, The Frost Institute)** | | | |
| 10:30 | Kristian Andersen | TSRI | Virus evolution at scale |
| 10:50 | Andrew Ward | TSRI | Rational vaccine design |
| 11:10 | Raphael Park | TSRI | In situ characterization of Mycobacteria for combating tuberculosis |
| 11:30 | Howard Hang | TSRI | Chemical dissection of microbiota mechanisms |
| 11:50  12:10 | James Paulson  Balyn Zaro | TSRI  UCSF | Targeting siglecs to induce immune tolerance  You are what you eat: The consequence of phagocytosis on the macrophage cell surface |
| 12:30-16:00 | **Break** |  |  |
| **Saturday Afternoon, May 4, 2024 Structural Biology and Biophysics**  **(Chair: Helen Berman, UCSF)** | | | |
| 16:00 | Mark DelCampo | Rigaku | A novel method for the observation and characterization of the 3D structure of monoclonal antibodies, capsids, and other therapeutic biomolecules: Electron density topography |
| 16:20  16:40 | Jawahar Sudhamsu  Allison Williams | Genentech  UCSF | Disulfide constrained Fabs overcome target size limitation for high-resolution single particle cryoEM  Penetrating bacterial defenses by attacking the cell wall-degrading machinery to disrupt bacterial metabolism |
| 17:00 | Arthur Olson | Scripps | Extended Reality (XR) for structural molecular biology |
| 17:20 | **Break** |  |  |
|  |  |  |  |
| **Saturday Afternoon, May 4, 2024 Membrane Proteins**  **(Chair: Andrew Ward, TSRI)** | | | |
| 17:40 | Mark Yeager | Frost Institute | CryoEM structures of full-length integrin αIIbβ3 in native lipids |
| 18:00 | Daniel Minor Jr. | UCSF | K2P channel function and chemical biology |
| 18:20 | Robert Stroud | UCSF | New approaches to drug discovery against transporters in TB |
| 18:40 | Marco Mravic | TSRI | Computational design of membrane protein molecular recognition |
| 19:00 | David Millar | TSRI | Conformational dynamics of chemokine receptors |
| **Sunday Morning, May 5, 2024 Therapeutics, Signaling & Activation**  **(Chair: Luke Lairson, TSRI)** | | | |
| 08:30 | Dillon Flood | Elsie Biotech | Design, delivery, and development of RNA therapeutics for precision treatment of CNS disorders |
| 08:50 | Kyle Knouse | Elsie Biotech | Structure activity relationship of oligonucleotide therapeutics |
| 09:10  09:30 | Travis Young  Beyza Bulutoglu | Calibr-Skaggs  Genentech | Immunotherapy - Bench to bedside  Stabilized IL-18 cytokine for cancer immunotherapy |
| 09:50 | **Break** |  |  |
| 10:10 | J. Michael Sauder | Lilly | Discovery & structural biology of the first oral small molecule inhibitor of Lipoprotein(a) formation |
| 10:30 | Xinxin Gao | Genentech | A disulfide constrained peptide platform to identify ZNRF3 antagonists for Wnt signaling activation |
| 10:50 | Natalia Jura | UCSF | Unlocking the mechanisms of HER/ERBB receptor tyrosine kinase activation and signaling |
| 11:10 | Andrej Šali & Ian Wilson | | Closing Remarks |

*In order to protect individual rights and promote discussion, it is a requirement of the Scripps/UCSF CABO Annual Meeting that no information presented is to be used or disclosed without the specific approval of the disclosing party. Each attendee of the Conference agrees that any information presented, whether in a formal talk or discussion, is a private communication from the individual making the contribution and is presented with the restriction that such information is not for public use. Each member of the Conference acknowledges and agrees to these restrictions as a condition of attending the Conference.*

*Thanks to our sponsors*

**Logo, company name

Description automatically generated**

**A blue text on a white background

Description automatically generatedA red text on a white background

Description automatically generatedA close-up of a logo

Description automatically generatedA blue and grey logo

Description automatically generatedText

Description automatically generated with low confidenceLogo

Description automatically generatedA logo with letters and numbers

Description automatically generatedA logo with black letters

Description automatically generatedA green sign with white text

Description automatically generated**