

Program

ENGINEERING CELL BIOLOGY III

August 9 - 12, 2009

Chaminade Resort, Santa Cruz, California, USA

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Endorsed by the American Society for Cell Biology

Conference Co-chairs

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Sunday, August 9, 2009

- 15:30 - 17:30 Registration (Seacliff Lounge and Terrace)
- 17:30 – 19:00 Opening Reception & Dinner (Sunset Patio and Restaurant)
- 19:00 – 19:10 **Opening Remarks**
- 19:10 – 20:30 **Plenary Session**

Cross-talk between cell adhesion complexes in the control of morphogenetic cell movements

W. James Nelson, Stanford University

Engineering materials and morphogens for modulating cell behavior

Jeffrey Hubbell, EPFL

NOTES

- Technical Sessions will be held in the **Santa Cruz** room.
- Poster Sessions will be held in the **La Selva** and **New Brighton** rooms.
- Authors of Session A posters are asked to remain by their posters during Session A. Authors of Session B posters are asked to remain by their posters during Session B.
- Breakfasts, lunches and dinners on Sunday and Monday will be in the Sunset Restaurant. The conference banquet on Tuesday will be in the Manresa room.
- Audiotaping, videotaping and photography of presentations are strictly prohibited.
- Speakers – Please leave at least 5 minutes for questions and discussion. Be available for discussion during meals and social periods.
- Please do not smoke at any conference functions.
- Turn your cellular telephones to vibrate or off during technical sessions.
- Be sure to make any corrections to your name/contact information on the Master Participant List or confirm that the listing is correct. A corrected copy will be sent to all participants after the conference.

Monday, August 10, 2009

- 08:00 – 08:45 Breakfast
- 09:00 – 11:45 **Session I: Systems analysis of cellular decision-making**
Session Chair: **Anand Asthagiri**, California Institute of Technology
- 09:00 – 09:35 *Systems analysis of cell apoptotic death-vs-survival decision processes*
Doug Lauffenburger, Massachusetts Institute of Technology
- 09:35 – 10:10 *TBA*
James Ferrell, Stanford University
- 10:10 – 10:30 *A systems biology approach to developing targeted therapies*
Matt Onsum, Merrimack Pharmaceuticals
- 10:30 – 10:50 Coffee Break
- 10:50 – 11:10 *A systems biology approach to DNA damage signaling in response to double strand breaks*
Andrea Tentner, Massachusetts Institute of Technology
- 11:10 – 11:45 *Systems immunology at the single-cell level*
Garry Nolan, Stanford University
- 11:45 – 14:00 Lunch Break
- 14:00 – 16:45 **Session II: Spatial and physical aspects of cell regulation**
Session Chair: **Elliot Hui**, University of California Irvine
- 14:00 – 14:35 *Modular control of endothelial cell migration*
Tobias Meyer, Stanford University
- 14:35 – 15:10 *TBA*
Rick Horwitz, University of Virginia
- 15:10 – 15:30 *Timing and spatial control of EGF-mediated focal adhesion maturation and cell edge dynamics*
Ian Schneider, Iowa State University
- 15:30 – 15:50 Coffee Break
- 15:50 – 16:10 *Mechanical regulation of endothelial cell network formation*
Cynthia Reinhart-King, Cornell University
- 16:10 – 16:45 *TBA*
Chris Chen, University of Pennsylvania
- 16:45 – 18:00 Free time / *ad hoc* sessions
- 18:00 - 19:30 Dinner
- 19:30 – 21:30 **Poster Session A** and Social Hour

Tuesday, August 11, 2009

- 08:00 – 08:45 Breakfast
- 09:00 – 11:45 **Session III: Mechanotransduction: a “soft touch” to parsing cell regulation**
Session Chair: **Cynthia Reinhart-King**, Cornell University
- 09:00 – 09:35 *Fibronectin is a mechano-chemical signal converter*
Viola Vogel, ETH-Zurich
- 09:35 – 10:10 *TBA*
Mike Sheetz, Columbia University
- 10:10 – 10:30 *Mechanotransductive engineering of neural stem cell behavior*
Albert Keung, University of California Berkeley
- 10:30 – 10:40 Coffee Break
- 10:40 – 11:10 *Regulation of EMT by mechanical signals from the microenvironment*
Esther Gomez, Princeton University
- 11:10 – 11:45 *Cell motility and assembly on compliant gels*
Dan Hammer, University of Pennsylvania
- 11:45 – 14:00 Lunch Break
- 14:00 – 16:50 **Session IV: Lessons from the niche: toward intelligent synthetic scaffolds**
Session Chair: **Alexander Revzin**, University of California Davis
- 14:00 – 14:35 *TBA*
Kristi Anseth, University of Colorado, Boulder
- 14:35 – 14:55 *Biomimetic enzymatically-degradable hydrogels for scleral reinforcement*
James Su, University of California Berkeley
- 14:55 – 15:15 *A little positivity goes a long way: optimal positive surface charge density supports neuron survival and polarization*
Kristin Michael, Forschungszentrum Jülich
- 15:15 – 15:35 *Solution-phase microtissues for high-throughput, multiplexed 3D tissue engineering*
Gregory Underhill, Massachusetts Institute of Technology /Harvard University
- 15:35 – 15:55 Coffee Break
- 15:55 – 16:15 *Combinatorial microenvironments regulate mammary progenitor cell fate*
Mark LaBarge, Lawrence Berkeley National Laboratory
- 16:15 – 16:50 *Bioartificial matrices to engineer morphogenesis and tissue repair*
Andres Garcia, Georgia Institute of Technology
- 17:00 – 19:00 Evening Poster Session B and Social Hour
- 19:00 – 21:00 Conference Banquet

Wednesday, August 12, 2009

08:00 – 08:45	Breakfast
09:00 – 11:45	<u>Session V: Multicellular structures and morphodynamics</u> Session Chair: Valerie Weaver , University of California San Francisco
09:00 – 09:35	<i>TBA</i> Senthil Muthuswamy , Cold Spring Harbor
09:35 – 10:10	<i>Cadherin-dependent mechanosensitive cell signaling in morphogenesis</i> Douglas DeSimone , University of Virginia
10:10 – 10:30	<i>Which cells actually migrate during embryonic morphogenesis?</i> Evan Zamir , Georgia Institute of Technology
10:30 – 10:50	Coffee Break
10:50 – 11:10	<i>Collagen remodeling, stromal cell activation and mammary tumorigenesis</i> Hongmei Yu , University of California San Francisco
11:10 – 11:45	<i>TBA</i> Keith Mostov , University of California San Francisco
11:45 – 12:00	Closing Remarks, Surveys
12:00 –	Lunch and Departure

Poster Presentations

Session A (Numbers 1-21)

- 1. MESENCHYMAL STEM CELL MOTILITY IN 3-D SYNTHETIC BIOMATERIALS WITH TUNABLE BIOPHYSICAL CUES**
Shelly R. Peyton, Massachusetts Institute of Technology, USA
- 2. LOGISTICAL CONSIDERATIONS FOR AN ACADEMIC CGMP CELL AND TISSUE ENGINEERING FACILITY**
Charles S. Cox, Jr., M.D., University of Texas - Houston Medical School, USA
- 3. COMBINATORIAL MICROENVIRONMENTS REGULATE MAMMARY PROGENITOR CELL FATE**
Mark LaBarge, Lawrence Berkeley National Lab, USA
- 4. MECHANOTRANSDUCTIVE ENGINEERING OF NEURAL STEM CELL BEHAVIOR**
Albert J. Keung, University of California – Berkeley, USA
- 5. MENA INVASIVE ISOFORMS MODULATE EGF-INDUCED CELL INVASION OF HUMAN BREAST CANCER CELLS**
Shannon Alford, Massachusetts Institute of Technology, USA
- 6. TIMING AND SPATIAL CONTROL OF EPIDERMAL GROWTH FACTOR-MEDIATED FOCAL ADHESION MATURATION AND CELL EDGE DYNAMICS**
Ian Schneider, Iowa State University, USA
- 7. CONSEQUENCES OF HETEROGENEOUS IL7 RESPONSIVENESS IN SHAPING THE NAÏVE T CELL REPERTOIRE**
Megan J. Palmer, Massachusetts Institute of Technology, USA
- 8. DISSECTING THE ROLE OF LAMININ-111 IN PROMOTING MAMMARY EPITHELIAL STRUCTURE AND FUNCTION**
Cyrus M. Ghajar, Lawrence Berkeley National Laboratory, USA
- 9. INTERPLAY OF BIOCHEMICAL AND MECHANICAL EXTRACELLULAR MATRIX PROPERTIES AFFECTS MAMMARY EPITHELIAL CELL MOTILITY AND CELL-CELL INTERACTION**
Olga Shebanova, University of Pennsylvania, USA
- 10. A METHOD OF MECHANICAL FORCE DETECTION OF INSULIN-LIKE GROWTH FACTOR-II BOUND TO RECEPTORS ON A LIVING CELL SURFACE USING AN AFM**
Chikashi Nakamura, National Institute of Advanced Industrial Science and Technology (AIST), Japan
- 11. DEVELOPING OF THE NEW CELL DISCRIMINATION METHOD BY DETECTION OF INTERACTION WITH USING ANTIBODY IMMOBILIZED NANONEEDLE**
Shingo Mieda, Tokyo University of Agriculture and Technology, Japan
- 12. MATRIX TOPOGRAPHY CONTROL OF CELL MIGRATION AND CELL ADHESIONS**
Andrew D. Doyle, National Institute of Dental and Craniofacial Research/NIH, USA
- 13. SHRNA SIGNATURES DEFINE MECHANISMS OF CELL DEATH IN SINGLE AND COMBINATION THERAPY**
Justin Pritchard, Massachusetts Institute of Technology, USA

14. **REGULATION OF EPITHELIAL-MESENCHYMAL TRANSITION BY MECHANICAL SIGNALS FROM THE MICROENVIRONMENT**
Esther W. Gomez, Princeton University, USA
15. **A SYSTEMS BIOLOGY APPROACH TO DNA DAMAGE SIGNALING: QUANTITATIVE MEASUREMENT AND MODELING OF THE DNA DAMAGE SIGNALING NETWORK IN RESPONSE TO DNA-DOUBLE STRAND BREAKS**
Andrea Tentner, Massachusetts Institute of Technology, USA
16. **WHICH CELLS ACTUALLY MIGRATE DURING EMBRYONIC MORPHOGENESIS?**
Evan Zamir, Georgia Institute of Technology, USA
17. **ROLE OF MICRORNAS IN REGULATING HEPATOCELLULAR CARCINOMA CELL BEHAVIOR**
Nancy Guillen, Massachusetts Institute of Technology, USA
18. **FUNCTIONAL MIMICRY OF THE HEPATOCELLULAR MICROENVIRONMENT TO CONTROL THE BEHAVIOR OF PRIMARY RAT LIVER CELLS IN VITRO**
Courtney M. Williams, Massachusetts Institute of Technology, USA
19. **CELL RESPONSES TO COLLAGEN MATRICES: DISTINCT INFLUENCES OF MATRIX PRESENTATION AND MECHANICAL STIFFNESS ON THE REGULATION OF FAK AND MYOSIN**
Kiran Bhadriraju, National Institute of Standards and Technology, USA
20. **REGULATION OF EPITHELIAL CELL MOTILE BEHAVIOR THROUGH CROSSTALK BETWEEN EXTRACELLULAR MATRIX- AND CELL-CELL ADHESIONS**
Nicolas Borghi, Stanford University, USA
21. **DIRECTED CELL MOTILITY ON 2-D MICRON-SCALE PATTERNS AND ITS APPLICATIONS**
Keiichiro Kushiro, California Institute of Technology, USA

Session B (Numbers 22-42)

22. **QUANTITATIVE ANALYSIS OF CONTACT-INHIBITION OF CELL MOTILITY AND EPITHELIAL AGGREGATION DYNAMICS**
Melissa D. Pope, California Institute of Technology, USA
23. **ADHESIVE MODIFICATION OF SELF-ASSEMBLING PEPTIDE SCAFFOLDS MODULATES HEPATOCYTE PHENOTYPES IN LONG TERM IN VITRO CULTURES**
Geeta Mehta, Massachusetts Institute of Technology, USA
24. **TUNABLE CROSSTALKS BETWEEN GROWTH FACTORS AND CELL-CELL CONTACT GOVERNS THE SPATIAL DYNAMICS OF EPITHELIAL GROWTH**
Jin-Hong Kim, California Institute of Technology, USA
25. **EFFECTS OF LAMININ CONTENT IN EXTRACELLULAR MATRIX UPON MDCK EPITHELIAL CELL MORPHOGENESIS**
Nduka O. Enemchukwu, Georgia Institute of Technology, USA
26. **THE WHERE, WHEN, AND HOW FAST OF CENTROMERE SPECIFICATION**
Sam Zeitlin, University of California – San Diego, USA
27. **TO SLEEP OR DIE: CELL FATE AFTER CHEMOTHERAPY**
Gerard Ostheimer, Massachusetts Institute of Technology, USA
28. **DIFFERENTIAL PROTEOMIC ANALYSIS OF MATRIX SENSING STEM CELL**
Thasaneeya Kuboki, Kyushu University, Japan
29. **A LITTLE POSITIVITY GOES A LONG WAY: OPTIMAL POSITIVE SURFACE CHARGE DENSITY SUPPORTS NEURON SURVIVAL AND POLARIZATION**
Kristin E. Michael, Institute for Bio and Nano Systems – Juelich, Germany
30. **DECONSTRUCTING THE 3RD DIMENSION: HOW MATRIX DIMENSIONALITY PROMOTES SURVIVAL**
Christian Frantz, University of California – San Francisco, USA
31. **SOLUTION-PHASE MICROTISSUES FOR HIGH-THROUGHPUT, MULTIPLEXED 3D TISSUE ENGINEERING**
Alice A. Chen, [Gregory Underhill](#), Massachusetts Institute of Technology/Harvard University, USA
32. **HOMEBOX GENE REGULATION OF MAMMARY TISSUE GROWTH AND SURVIVAL**
Janna K. Mouw, University of California – San Francisco, USA
33. **ENGINEERED POLYMER MICROENVIRONMENTS FOR PROBING Ca^{2+} MECHANOTRANSDUCTION USING DORSAL CELL ADHESION**
Warren C. Ruder, Carnegie Mellon University, USA
34. **BIOMECHANICAL REGULATION OF BREAST CANCER MIGRATION**
Jose Lopez, University of California – San Francisco, USA
35. **COLLAGEN REMODELING, STROMAL CELL ACTIVATION AND MAMMARY TUMORIGENESIS**
Hongmei Yu, University of California – San Francisco, USA
36. **MULTI-PARAMETER FACS ANALYSIS FOR EVALUATING HIGH PRODUCING CHO CELL LINES**
Wen-Lin Tsai, Genentech, Inc., USA

37. **EGFR ONCOGENE ADDICTION IN LUNG CANCER: CELLULAR DECISION MAKING IN RESPONSE TO “TARGETED” THERAPEUTICS**
Matthew J. Lazzara, University of Pennsylvania, USA
38. **INTEGRINS ALONE COULD SENSE CHEMICAL AND PHYSICAL PROPERTIES OF THE EXTRACELLULAR MATRIX**
Matthew Paszek, University of California – San Francisco, USA
39. **A SYSTEMS BIOLOGY APPROACH TO DEVELOPING TARGETED THERAPIES**
Matthew Onsum, Merrimack Pharmaceuticals, USA
40. **MECHANICAL REGULATION OF ENDOTHELIAL CELL NETWORK FORMATION**
Cynthia A. Reinhart-King, Cornell University, USA
41. **PODOSOMES AS MECHANOCHEMICAL TRANSDUCERS**
Cynthia A. Reinhart-King, Cornell University, USA
42. **BIOMIMETIC ENZYMATICALLY-DEGRADABLE HYDROGELS FOR SCLERAL REINFORCEMENT**
James Su, University of California – Berkeley, USA