CEMB Center for Engineering MechanoBiology

Saturday, 12 October

8am — **Registration Desk Open 8:00am - 5:00pm**
Whitaker Hall Atrium, 1st Floor

8am — **Continental Breakfast Served 8:00 - 8:45 am**
Parkside Cafe, Schnuck Pavilion

8:45am — **Opening Ceremony**

» Liz Haswell and Guy Genin (Washington University in St. Louis)

8:50am — **Welcome Address**
Whitaker Hall Auditorium, Room 100

» Phil Taylor (Bayer Crop Science USA)

8:55am — **A brief introduction to CEMB, the NSF Science and Technology Center for Engineering MechanoBiology**

» CEMB Director, Vivek Shenoy (University of Pennsylvania)

9am — **Session 1: Cardiac Mechanobiology: A Symposium in Memory of Bill Hunter**
Chaired by: Dr. Treena Arinzeh

9am — **The mechanics of living tissues: the academic life of William C. Hunter, Ph.D. from a student, colleague, career mentor and friend**
» Prof. Brian Pfister[1] (1. New Jersey Institute of Technology)

9:45am — **Mechano-sensing and thoracic aortic aneurysms**
» Prof. Jay Humphrey[1] (1. Yale University)

10:15am — **Coffee Break**

10:30am — **Session 2**
Chaired by: Anders Carlsson

10:30am — **Making waves: the mechanics of oscillations in cilia and flagella**
» Prof. Philip Bayly[1], Mr. Louis Woodhams[1], Dr. Matthieu Bottier[1], Mx. Tianci Hu[1], Prof. Susan Dutcher[1] (1. Washington University in St. Louis)

11am — **Zein protein fibrous matrices for promoting cell growth and osteogenic differentiation**
» Ms. Apurva Limaye[1], Ms. Jessica Cardenas Turner[1], Dr. Treena Arinzeh[1] (1. New Jersey Institute of Technology)

11:15am — **Understanding directional growth in plants through cell wall mechanics**
» Dr. Siobhan Braybrook[1], Dr. Firas Bou Daher[1] (1. University of California, Los Angeles)

11:45am — **Extracting mechanical properties of plant cells from atomic-force microscopy and micro-compression experiments**
» Ms. Leah Ginsberg[1], Dr. Eleftheria Roumeli[1], Prof. Guruswami Ravichandran[1], Prof. Chiara Daraio[1] (1. California Institute of Technology)

12pm — **Developing artificial scaffolds for plant cell growth**
» Mr. Ryan Calcutt[1], Mr. Richard Vincent[2], Dr. Derrick Dean[3], Dr. Treena Arinzeh[2], Dr. Ram Dixit[1] (1. Washington University in St. Louis, 2. New Jersey Institute of Technology, 3. Alabama State University)

12:15pm — **Lunch**
Parkside Cafe, Schnuck Pavilion

1:15pm — **Session 3**
Chaired by: Prof. Joel Boerckel

The CEMB is funded by an NSF Science and Technology Center grant (CMMI):15-48571

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Continued from **Saturday, 12 October**

1:15pm **Substrate-grafted iPSC-derived micro heart muscles to investigate effects of mechanical loading on tissue physiology**
» Mr. Daniel Simmons[1], Ms. Jingxuan Guo[1], Ms. Mary Munsell[1], Mr. Brennan Kandalaft[1], Mr. David Schuftan[1], Dr. Nathaniel Huebsch[1] (1. Washington University in St. Louis)

1:30pm **Emergence of tissue-like mechanics from fibrous networks confined by close-packed cells**
» Dr. Anne van Oosten[1], Mr. Xingyu Chen[2], Dr. LiKang Chin[2], Ms. Katrina Kruz[2], Prof. Allison Patteson[3], Prof. Katarzyna Pogoda[4], Prof. Vivek Shenoy[2], Prof. Paul Janmey[2] (1. Leiden University, 2. University of Pennsylvania, 3. Syracuse University, 4. Polish Academy of Sciences)

1:45pm **Tearing down walls and other stories of resistance...to stress in plants**
» Prof. José Dinneny[1] (1. Stanford University)

2:15pm **Stress-dependent regulation of microtubule alignment during plant cell morphogenesis**
» Mr. Jing Li[1], Dr. Taeyoon Kim[1], Dr. Daniel Szymanski[1] (1. Purdue University)

2:30pm **Mechanical memory of cells arises from of synergistic coupling between mechanosensitive transcription and cytoskeletal signaling**
» Mr. Jairaj Mathur[1], Prof. Vivek Shenoy[2], Dr. Amit Pathak[1] (1. Washington University in St. Louis, 2. University of Pennsylvania)

2:45pm **Coffee Break**

3:15pm **Session 4**
Chaired by: Dr. Lucia Strader

3:15pm **YAP and TAZ coordinate endochondral ossification**
» Mr. Joseph Collins[1], Prof. Nathaniel Dyment[1], Prof. Joel Boerckel[1] (1. University of Pennsylvania)

3:30pm **The role of mechanics in organ size and shape robustness of Arabidopsis**
» Prof. Adrienne Roeder[1] (1. Cornell University)

4pm **Microstructured hydrogels to probe paracrine and mechanosignaling during lung organoid formation**
» Dr. Claudia Loebel[1], Ms. Christina Hummel[1], Dr. Jarod Zepp[1], Prof. Edward Morrisey[1], Prof. Jason Burdick[1] (1. University of Pennsylvania)

4:15pm **Is cellulose synthesis a Brownian ratchet?**
» Prof. Tobias Baskin[1] (1. University of Massachusetts Amherst)

4:45pm **Expanding without exploding: measuring and modeling the biomechanics of pollen hydration**
» Ms. Kari Miller[1], Dr. Anders Carlsson[1], Prof. Elizabeth Haswell[1] (1. Washington University in St. Louis)

5pm **Registration Closes**
Whitaker Hall Atrium, 1st Floor

5pm **Poster Session Reception**
Whitaker Hall Atrium, 1st Floor

5pm **Poster Session**
Chaired by: Prof. Elizabeth Haswell

101 - Regulation of nuclear architecture, mechanics and nucleo-cytoplasmic shuttling of epigenetic factors by cell geometric constraints
» Dr. Farid Alisafaei[1], Dr. Doorgesh Sharma Jokhun[2], Prof. G.V. Shivashankar[2], Prof. Vivek Shenoy[1] (1. University of Pennsylvania, 2. National University of Singapore)

102 - Oligomerization and nucleocytoplasmic partitioning of NLP transcription factors in the plant nitrate response
» Mr. Jeffrey Allen[1], Dr. Lucia Strader[1] (1. Washington University in St. Louis)

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103 - The mechanobiology of crawling Euglena

» Prof. Marino Arroyo[1] (1. Universitat Politècnica de Catalunya - BarcelonaTech)

104 - Is MSL10 involved in maintaining cellular mechanostasis during abiotic and biotic stresses?

» Dr. Debarati Basu[1], Prof. Elizabeth Haswell[1] (1. Washington University in St. Louis)

105 - A mechano-chemical approach to understanding directional plant growth patterns

» Ms. Natasha Bilkey[1], Mr. Huiyong Li[1], Dr. Marcus Foston[1], Dr. Ram Dixit[1] (1. Washington University in St. Louis)

106 - All models are not created equal: comparing and contrasting two modeling paradigms in mechanobiology

» Dr. Christopher Stubbs[1], Dr. Siobhan Braybrook[2], Dr. Douglas Cook[3] (1. University of Idaho, 2. University of California, Los Angeles, 3. Brigham Young University)

107 - Patterning of cell populations by strain-cued solitary waves

» Mr. Brian Cox[1] (1. Independent)

108 - Simvastatin, but not Losartan, dose-dependently inhibits gel contraction and reduces viability of NIH3T3 and human elbow capsule cells in vitro

» Dr. Michael David[1], Mr. James Abraham[1], Dr. Aaron Chamberlain[1], Dr. Spencer Lake[1] (1. Washington University in St. Louis)

109 - An optics-free and in situ platform for measuring the mechanical properties of films and tissues with high temporal resolution

» Prof. Charles Dhong[1] (1. University of Delaware)

110 - Piconewton forces measured using vinculin and a-Actinin tension sensors at the sarcomere within induced pluripotent stem cell-derived cardiomyocytes

» Dr. Palash Dutta[1], Dr. Anant Chopra[1], Ms. Paige Cloonan[1], Dr. Subramanian Sundaram[1], Ms. Jourdan Ewoldt[1], Prof. Christopher Chen[1] (1. Boston University)

111 - A multi-resolution approach for modeling and characterization of biological tissues

» Prof. Ahmed Elbanna[1] (1. University of Illinois at Urbana-Champaign)

112 - Comparative biomechanical characterization of maize brace roots within and between plants

» Mx. Lindsay Erndwein[1], Ms. Elahe Ganji[1], Dr. Megan Killian[1], Dr. Erin Sparks[1] (1. University of Delaware)

113 - Structural determinants of the SPIRAL2 protein important for chiral plant growth

» Dr. Ram Dixit[1], Dr. Yuanwei Fan[1], Ms. Natasha Bilkey[1] (1. Washington University in St. Louis)

114 - Investigating the role of deformation-deposition in anti-fouling response of mammalian fur

» Prof. Ranajay Ghosh[1], Mr. Hessein Ali[1], Dr. Dipankar Biswas[1], Mr. Milos Krsmanovic[1], Prof. Andrew Dickerson[1] (1. university of central florida)

115 - Extracting mechanical properties of plant cells from atomic-force microscopy and micro-compression experiments

» Ms. Leah Ginsberg[1], Dr. Eleftheria Roumeli[1], Prof. Guruswami Ravichandran[1], Prof. Chiara Daraio[1] (1. California Institute of Technology)

116 - Characterization of Arabidopsis hypocotyl viscoelasticity

» Mr. Ethan Hoppe[1], Mr. Reid Chunn[2], Mr. Ryan Emenecker[1], Dr. Roger Rowe[1], Dr. Kenneth Pryse[3], Dr. Barbara Pickard[1], Dr. Lucia Strader[1], Prof. Guy Genin[1] (1. Washington University in St. Louis, 2. Harris Stowe State University, 3. Washington University in Saint Louis)

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117 - Bioprinting of complex 3D vascular networks within cell-laden hydrogels

» Mr. Shen Ji[1], Prof. Murat Guvendiren[1] (1. New Jersey Institute of Technology)

118 - Distinguishing mechanical and structural effects on cellular mechano-responsiveness in a 3D porous scaffold

» Mr. Shumeng Jiang[1], Mr. Cheng Lyu[2], Prof. Guy Genin[1], Prof. Yanan Du[2] (1. Washington University in St. Louis, 2. Tsinghua University)

119 - Upscaling active-gel theory of actomyosin cortex to epithelial mechanics

» Dr. Sohan Kale[1], Mr. Adam Ouzeri[2], Dr. Alejandro Torres-Sánchez[2], Prof. Marino Arroyo[2] (1. Virginia Tech, 2. Universitat Politècnica de Catalunya - BarcelonaTech)

120 - Magnetoactive substrates for cell mechanobiology

» Mx. Emile Kraus[1], Mr. Andy Clark[2], Dr. Alexander Bennett[1], Prof. Paul Janmey[1], Prof. Xuemei Cheng[2] (1. University of Pennsylvania, 2. Bryn Mawr College)

121 - A spiral growth study to reveal chemical nature and plant cell wall mechanics using AFM-IR

» Mr. Huiyong Li[1], Ms. Natasha Bilkey[1], Dr. Marcus Foston[1], Dr. Ram Dixit[1] (1. Washington University in St. Louis)

122 - In silico exploration of mechanical properties of extracellular matrix and cation channel activity in cartilage

» Mr. Deng Li[1], Mr. Kai chih Yeh[1], Prof. Shu-Wei Chang[1] (1. National Taiwan University)

123 - Opposite responses of normal hepatocytes and hepatocellular carcinoma cells to substrate viscoelasticity

» Dr. Kalpana Mandal[1], Dr. Ze Gong[1], Mrs. Alexis Rylander Bennett[1], Prof. Vivek Shenoy[1], Prof. Paul Janmey[1] (1. University of Pennsylvania)

124 - The functional impact of Nav1.5 sodium channel mechanosensitivity modeled by an in silico smooth muscle cell model

» Mr. Arnaldo Mercado-Perez[1], Mr. Peter Strege[1], Dr. Gianrico Farrugia[1], Dr. Arthur Beyder[1] (1. Mayo Clinic)

125 - Controlling osteoblast activity with copper-free azide-alkyne cycloaddition of integrin binding peptides to alginate hydrogels

» Ms. Sydney Neal[1], Dr. Era Jain[1], Ms. Rama Balasubramaniam[1], Dr. Nathaniel Huebsch[1], Dr. Lori Setton[1] (1. Washington University in St. Louis)

126 - Beyond tensegrity the Pavlides Elastegrity (PE)

» Prof. Eleftherios Pavlides[1] (1. Roger Williams University)

127 - Functional characterization of plant members of the Piezo mechanosensitive ion channel family

» Dr. Ivan Radin[1], Mr. Ryan Richardson[1], Dr. Carlisle Bascom[2], Mr. Ethan Weiner[1], Prof. Magdalena Bezanilla[3], Prof. Elizabeth Haswell[1] (1. Washington University in St. Louis, 2. University of California, San Diego, 3. Dartmouth College)

128 - Mechanisms of efficient hierarchical compaction of collagen by fibroblasts

» Dr. Delaram Shakiba[1], Dr. Farid Alisafaei[2], Mr. Alireza Savadipour[1], Dr. Roger Rowe[3], Mr. Zhangao Liu[1], Dr. Kenneth Pryse[1], Prof. Vivek Shenoy[2], Prof. Elliot Elson[1], Prof. Guy Genin[1] (1. Washington University in St. Louis, 2. University of Pennsylvania, 3. Washington University in Saint Louis)

129 - Tissue interfacial stresses modulate cell-ECM interactions

» Mr. Xuechen Shi[1], Mr. Tiankai Zhao[1], Prof. Sulin Zhang[1] (1. The Pennsylvania State University)

130 - Maintaining self-control: Intramolecular regulation of cell death signaling by mechanosensitive channel MSL10

» Ms. Jennette Shoots[1], Dr. Debarati Basu[1], Prof. Elizabeth Haswell[1] (1. Washington University in St. Louis)

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131 - Efficient fabrication of lung-on-a-chip device with in situ imaging capabilities

» Ms. Whitney Sinclair[1], Dr. Deborah Leckband[1], Dr. Paul Kenis[1], Dr. Catherine Murphy[1] (1. University of Illinois at Urbana-Champaign)

132 - MD modeling of YAP mechanosensing in cancer progression

» Mr. Tom Stadtmüller[1], Prof. Patrick Onck[1], Prof. Siewert-Jan Marrink[1], Prof. Erik Van der Giessen[1] (1. University of Groningen)

133 - Evaluating the effect of surface charge of piezoelectric fibrous scaffolds for plant cell culture

» Mr. Richard Vincent[1], Mr. Ryan Calcutt[2], Dr. Derrick Dean[3], Dr. Ram Dixit[2], Dr. Treena Arinzeh[1] (1. New Jersey Institute of Technology, 2. Washington University in St. Louis, 3. Alabama State University)

134 - Epithelial cells sense distant stiffness through ECM deformation and realignment

» Dr. Christopher Walter[1], Dr. Amit Pathak[1] (1. Washington University in St. Louis)

135 - Mechanosensitive ion channels MSL7 and MSL8 play multiple roles in pollen biology

» Dr. Yanbing Wang[1], Prof. Elizabeth Haswell[1], Mr. Gregory Jensen[1] (1. Washington University in St. Louis)

136 - Biomolecular condensates in motion

» Mr. Edward Wilkinson[1], Mr. Ryan Emenecker[1], Dr. Lucia Strader[1] (1. Washington University in St. Louis)

137 - Mechanomorphogenesis of bacterial biofilms

» Prof. Jing Yan[1] (1. Yale University)

Notes

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