



# Bio-X Interdisciplinary Initiatives Seed Grants Program Symposium

## Poster Session

### August 26, 2015

Odd-numbered posters will be presented from 4:00-4:45pm.  
Even-numbered posters will be presented from 4:45-5:30pm.

POSTER #	TITLE	AUTHORS
1	Applying Bayesian Model Averaging to the Optimization of Computational Water Models	Han Altae-Tran <sup>1,2,3</sup> , Lee-Ping Wang <sup>5</sup> , Vijay Pande <sup>4</sup> Departments of Mathematics <sup>1</sup> , Physics <sup>2</sup> , Electrical Engineering <sup>3</sup> , and Chemistry <sup>4</sup> Stanford University; Department of Chemistry <sup>5</sup> , UC Davis
2	Investigating Diurnal Cortisol as a Biomarker for Developing Affective Disorders in Children	Cameron Backes <sup>1</sup> , Lara Foland-Ross <sup>1</sup> , Ian Gotlib <sup>2</sup> , Joelle LeMoult <sup>2</sup> , Manpreet Singh <sup>1</sup> Departments of Psychiatry & Behavioral Sciences <sup>1</sup> and Psychology <sup>2</sup> , Stanford University
3	Divergent Evolution <i>in vitro</i> : Engineering Specialized Drug Sensitivity in Proteases for Cellular Engineering Applications	Ryan Badiee <sup>1</sup> , Conor Jacobs <sup>1</sup> , Michael Z. Lin <sup>2,3</sup> Departments of Biology <sup>1</sup> , Bioengineering <sup>2</sup> , and Pediatrics <sup>3</sup> , Stanford University
4	Evolution of Larger Body Size During Transitions from Terrestrial to Aquatic Habitats in Snakes (Suborder Serpentes)	Matthew Benjamin <sup>1</sup> , William Gearty <sup>2</sup> , Jonathan Payne <sup>2</sup> Departments of Biology <sup>1</sup> and Geological Sciences <sup>2</sup> , Stanford University
5	Polymorphic Residues in NLRP1 Control <i>Toxoplasma gondii</i> Sensing	Jordan Brzezny <sup>1</sup> , Sarah Ewald <sup>1</sup> , John Boothroyd <sup>1</sup> Department of Microbiology & Immunology <sup>1</sup> , Stanford University
6	Optimizing HR of HBB Locus Using CRISPR/Cas9 and RAAV6 in HPSCs	Joab Camarena <sup>1</sup> , Daniel Dever <sup>1</sup> , Ayal Hendel <sup>1</sup> , Matthew Porteus <sup>1</sup> Department of Pediatrics <sup>1</sup> , Stanford University
7	Localization and Interactions of Photosynthetic Components in <i>Chlamydomonas reinhardtii</i>	Chris Chen <sup>1</sup> , Luke Mackinder <sup>2</sup> , Martin Jonikas <sup>1,2</sup> Department of Biology <sup>1</sup> , Stanford University; Department of Plant Biology <sup>2</sup> , Carnegie Institution for Science
8	CD248 Defines a Subpopulation of Pro-Angiogenic Adipose Derived Stromal Cells	Monica C. Chin <sup>1</sup> , Stephanie M. Vistnes <sup>1</sup> , Elizabeth R. Zielins <sup>1</sup> , Elizabeth A. Brett <sup>1</sup> , Charles Blackshear <sup>1</sup> , Derrick C. Wan <sup>1</sup> , Michael T. Longaker <sup>1,2</sup> Department of Surgery (Division of Plastic & Reconstructive Surgery) <sup>1</sup> and Institute for Stem Cell Biology & Regenerative Medicine <sup>2</sup> , Stanford University
9	Evaluation of Candidate Agonists for the Orexin Receptor and Implications on Cardiac Function	Brian Chu <sup>1,2</sup> , Ching Shang <sup>1,2</sup> , Marco Perez <sup>1,2</sup> , Euan Ashley <sup>1,2</sup> Center for Inherited Cardiovascular Disease <sup>1</sup> and Department of Medicine (Division of Cardiovascular Medicine) <sup>2</sup> , Stanford University
10	The Effect of Low Carb vs. Low Fat Dietary Interventions on Human Adipose Cell Size	Coraal Cohen <sup>1</sup> , Erin Avery <sup>2</sup> , Lifen Liu <sup>1</sup> , Elizabeth Colbert <sup>1</sup> , Samuel Cushman <sup>3</sup> , Christopher Gardner <sup>2</sup> , Tracey McLaughlin <sup>1</sup> Departments of Endocrinology <sup>1</sup> and Stanford Prevention Research Center <sup>2</sup> , Stanford University; NIDDK <sup>3</sup> , National Institutes of Health
11	Using Genetic Variant Analysis to Find Novel Transcript Isoforms in Type 2 Diabetes	Amartya Das <sup>1</sup> , Brian D. Piening <sup>1</sup> , Andrew M. Lipchik <sup>1</sup> , Michael P. Snyder <sup>1</sup> Department of Genetics <sup>1</sup> , Stanford University
12	Targeting Epigenetic Repression to Induce Neural Differentiation in Medulloblastoma	Lauren Ellis <sup>1</sup> , James Purzner <sup>2</sup> , Matthew Scott <sup>2</sup> , Yoon-Jae Cho <sup>1</sup>

		Departments of Neurology <sup>1</sup> and Developmental Biology <sup>2</sup> , Stanford University
13	Representation of Decision Formation Signals in Premotor Cortex when Choice Is Reported by Eye and Hand	Bora Erden <sup>1</sup> , Diogo Peixoto <sup>1,2</sup> , William T. Newsome <sup>1,3</sup> Department of Neurobiology <sup>1</sup> and Howard Hughes Medical Institute <sup>3</sup> , Stanford University; Champalimaud Neuroscience Programme <sup>2</sup>
14	Rabies-Tracing Mediated Exploration of Inputs to the Substantia Nigra	Kathryn E. Evans <sup>1</sup> , Talia N. Lerner <sup>2,3</sup> , Karl Deisseroth <sup>2,3,4,5</sup> Departments of Biology <sup>1</sup> , Bioengineering <sup>2</sup> , and Psychiatry & Behavioral Sciences <sup>4</sup> , Howard Hughes Medical Institute <sup>5</sup> , and CNC Program <sup>3</sup> , Stanford University
15	Immunosenescence in Major Depressive Disorder	Tanvi Gambhir <sup>1,2</sup> , Dhivya Perumal <sup>1,2</sup> , Krista Ring <sup>1,2</sup> , Elissa Epel <sup>3</sup> , Synthia Mellon <sup>4</sup> , Owen M. Wolkowitz <sup>3</sup> , and Firdaus S. Dhabhar <sup>1,2,5,6,7,8</sup> Laboratory of Stress Immunology <sup>1</sup> and Department of Psychiatry & Behavioral Sciences <sup>2</sup> , Stanford Institute for Immunity, Transplantation, & Infection <sup>5</sup> , Stanford Cancer Institute <sup>6</sup> , Stanford Neurosciences Institute <sup>7</sup> , and Bio-X Program <sup>8</sup> , Stanford University; Departments of Psychiatry <sup>3</sup> and OB/GYN & Reproductive Sciences <sup>4</sup> , UCSF
16	<i>Pseudomonas aeruginosa</i> Pf4 Phage Is an Inhibitor of <i>Aspergillus fumigatus</i> Biofilm Formation and Development	Omar Garcia <sup>1</sup> , Andrey Malkovskiy <sup>1</sup> , Johanna Sweere <sup>1</sup> , Gernot Kaber <sup>1</sup> , John Penner <sup>1,2</sup> , José Ferreira <sup>1,2</sup> , Patrick Secor <sup>3</sup> , Karl Clemons <sup>1,2</sup> , David Stevens <sup>1,2</sup> , Paul Bollyky <sup>1</sup> Department of Medicine (Division of Infectious Diseases) <sup>1</sup> , Stanford University; California Institute for Medical Research <sup>2</sup> , San Jose; Department of Microbiology <sup>3</sup> , University of Washington
17	Automating the Analysis of Dendritic Spine Data Sets	Druthi Ghanta <sup>1,2</sup> , Maja Djurisic <sup>2</sup> , Assaf Hoogi <sup>3</sup> , Daniel L. Rubin <sup>3</sup> , Carla J. Shatz <sup>2</sup> Departments of Computer Science <sup>1</sup> , Neurobiology <sup>2</sup> , and Radiology <sup>3</sup> , Stanford University
18	The Wound Healing Response Promotes Tumor Cell Invasion and Metastasis	Meghana Golla <sup>1</sup> , Marjan Rafat <sup>1</sup> , Megan Albertelli <sup>1</sup> , Marta Vilalta <sup>1</sup> , Todd A. Aguilera <sup>1</sup> , Amato J. Giaccia <sup>1</sup> , Edward E. Graves <sup>1</sup> Department of Radiation Oncology <sup>1</sup> , Stanford University
19	Structure Function Studies of Drosophila Myb-Interacting Protein Mip40	Daniel M Gonzalez <sup>1,2</sup> , Laura Andrejka <sup>1,2</sup> , Joseph Lipsick <sup>1,2</sup> Departments of Pathology <sup>1</sup> and Genetics <sup>2</sup> , Stanford University
20	Membrane Lipid Composition Regulating Influenza Binding Visualized on the Single Virion Level	Isabel Goronzy <sup>1</sup> , Robert Rawle <sup>2</sup> , Peter Kasson <sup>2</sup> , Steven Boxer <sup>1</sup> Department of Chemistry <sup>1</sup> , Stanford University; Department of Molecular Physiology & Biological Physics <sup>2</sup> , University of Virginia
21	Using Force Control to Study Motor Coordination in the Human Brain	Deeksha Goyal <sup>1</sup> , Samir Menon <sup>1</sup> , Oussama Khatib <sup>1</sup> Department of Computer Science <sup>1</sup> , Stanford University
22	Homeodomain Interacting Protein Kinase 4 Positively Regulates the Hedgehog Signaling Pathway	Zane J. Hellmann <sup>1</sup> , J. Aaron Crapster <sup>1</sup> , Paul G. Rack <sup>1</sup> , Michael Eisenberg <sup>2</sup> , and James K. Chen <sup>1</sup> Departments of Chemical & Systems Biology <sup>1</sup> and Urology <sup>2</sup> , Stanford University
23	Investigating Behavioral Changes in Mice Following Medial Entorhinal Cortex Grid Cell Scale Expansion	Ashley Henderson <sup>1</sup> , Caitlin Mallory <sup>2</sup> , Lisa Giocomo <sup>2</sup> Departments of Biology <sup>1</sup> and Neurobiology <sup>2</sup> ,

		Stanford University
24	Restoring BDNF Delivery on the Cortical-Striatal Axis: A Therapeutic Strategy for Huntington's Disease	Nicolas Herrera <sup>1</sup> , Michael T. Maloney <sup>1</sup> , Yanmin Yang <sup>1</sup> Department of Neurology & Neurological Sciences <sup>1</sup> , Stanford University
25	DNA Melt as a Rapid Fingerprint for Broad-Range Pathogen Identification and Serotyping	Annie Hu <sup>1</sup> , Nadya Andini <sup>1</sup> , Samuel Yang <sup>1</sup> Department of Emergency Medicine <sup>1</sup> , Stanford University
26	Bioengineering of Functional Cardiac Tissues	Daniel A. Hu <sup>1</sup> , Vahid Serpooshan <sup>1</sup> , Sean M. Wu <sup>1,2,3,4</sup> Cardiovascular Institute <sup>1</sup> , Department of Medicine (Division of Cardiovascular Medicine) <sup>2</sup> , Institute for Stem Cell Biology & Regenerative Medicine <sup>3</sup> , and Child Health Research Institute <sup>4</sup> , Stanford University
27	CRISPR/Cas-Mediated Genome Editing in Neurons	Ian Hull <sup>1</sup> , Louise Giam <sup>2</sup> , Thomas Südhof <sup>2</sup> Departments of Bioengineering <sup>1</sup> and Molecular & Cellular Physiology <sup>2</sup> , Stanford University
28	Localized Analysis of Pericyte Proliferation in Coronary Artery Maturation	Andrew Jacobs <sup>1</sup> , Katharina Volz <sup>1</sup> , Kristy Red-Horse <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
29	Examining the Function of Individual A-to-I RNA Editing Sites in <i>Drosophila</i>	Dionna Jacobson <sup>1</sup> , Tricia Deng <sup>1</sup> , Lisa Zhang <sup>1</sup> , Chris Li <sup>1</sup> , Carrie Yan <sup>1</sup> , Nora Nguyen <sup>1</sup> , Jin Billy Li <sup>1</sup> Department of Genetics <sup>1</sup> , Stanford University
30	The Role of Inhibition in the Coding of Cutaneous Temperature in the Spinal Cord	Gabbi Kamalani <sup>1,2</sup> , Chen Ran <sup>1,2</sup> , Xiaoke Chen <sup>1,2</sup> Department of Biology <sup>1</sup> and Bio-X <sup>2</sup> , Stanford University
31	Key Amino Acid Residues in the Ketosynthase Active Site of a Polyketide Assembly Line	Joshuah Kapilivsky <sup>1</sup> , Thomas Robbins <sup>1</sup> , Chaitan Khosla <sup>1,2</sup> Departments of Chemistry <sup>1</sup> and Chemical Engineering <sup>2</sup> , Stanford University
32	Computational Analysis of Social Behavior in a Fish ( <i>Astatotilapia burtoni</i> )	Katrina Kent <sup>1</sup> , Austin Hilliard <sup>1</sup> , Scott Juntti <sup>1</sup> , Rosa Alcazar <sup>1</sup> , Russell Fernald <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
33	Toward Understanding the Functional Relevance of Nemitin's Post-Translational Modifications in Neurons	Habib Khoury <sup>1</sup> , Ivan Millan <sup>1</sup> , Yanmin Yang <sup>1</sup> Department of Neurology & Neurological Sciences <sup>1</sup> , Stanford University
34	Targeted Delivery of siRNA Using Knottin-Protein Conjugates for Atherosclerosis and Abdominal Aortic Aneurysms	Camila R. Kofman <sup>1</sup> , Sandra M. DePorter <sup>1</sup> , Sungwon Lim <sup>1</sup> , Jennifer R. Cochran <sup>1</sup> Department of Bioengineering <sup>1</sup> , Stanford University
35	Mapping Changes in Proteome Stability in Response to Acute Protein Misfolding Events	Nira Krasnow <sup>1</sup> , Airlia Thompson <sup>1</sup> , Ron Kopito <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
36	Assessing the Role of Neurosteroids in the Pathophysiology and Treatment of Autism Spectrum Disorder	Lauren Kwa <sup>1</sup> , Wenchao Sun <sup>2</sup> , Robin Libove <sup>1</sup> , Jennifer Phillips <sup>1</sup> , Francois Haddad <sup>3</sup> , Serena Tanaka <sup>1</sup> , Antonio Hardan <sup>1</sup> , Lawrence K. Fung <sup>1</sup> Departments of Psychiatry & Behavioral Sciences <sup>1</sup> and Medicine (Division of Cardiovascular Medicine) <sup>3</sup> and Biomaterials & Advanced Drug Delivery Lab <sup>2</sup> , Stanford University
37	Improving Computational Performance for Real-Time Forward Dynamics Musculoskeletal Simulations	Thomas Lau <sup>1</sup> , Christopher Dembia <sup>1</sup> , Michael Sherman <sup>1</sup> , Ajay Seth <sup>1</sup> , Scott Delp <sup>1</sup> Department of Bioengineering <sup>1</sup> , Stanford University
38	Injectable, Long-Term Two Component Hydrogels for Spinal Cord Regeneration	Kaz Lewis <sup>1</sup> , Karen Dubbin <sup>1</sup> , Lei Cai <sup>1</sup> , Laura Marquardt <sup>1</sup> , Vanessa Doulames <sup>2</sup> , Giles Plant <sup>2</sup> , Sarah Heilshorn <sup>1</sup> Departments of Materials Science & Engineering <sup>1</sup> and Neurosurgery <sup>2</sup> , Stanford University

39	The Role of AUTS18 Deregulation in Synaptic Dysfunction of Human Excitatory Neurons	Jason Li <sup>1,2</sup> , Bahareh Haddad <sup>1,2</sup> , Marius Wernig <sup>1,2</sup> Institute for Stem Cell Biology & Regenerative Medicine <sup>1</sup> and Department of Pathology <sup>2</sup> , Stanford University
40	Miniaturized Inductive RFID tags for Cellular Level Sensing	Xiaolin Hu <sup>1</sup> , Wendy Li <sup>1</sup> , Mimi Yang <sup>1</sup> , H.S. Philip Wong <sup>1</sup> Department of Electrical Engineering <sup>1</sup> , Stanford University
41	Investigating the Regulation of NGFR in Human Triple Negative Breast Cancer Cells	Lillian Liao <sup>1</sup> , Meghah Vuppapalaty <sup>1</sup> , Angera Kuo <sup>1</sup> , Michael Clarke <sup>1</sup> Institute for Stem Cell Biology & Regenerative Medicine <sup>1</sup> , Stanford University
42	The Role of MicroRNA-126 in Tumor Angiogenesis	Cynthia Kosinski <sup>1</sup> , Terry Reyes <sup>1</sup> , Majed Magzoub <sup>2</sup> , George Chen <sup>3</sup> , Junlei Chang <sup>1</sup> , Frank Kuhnert <sup>1</sup> , Calvin J. Kuo <sup>1</sup> Departments of Medicine <sup>1</sup> , Bioengineering <sup>2</sup> , and Biology <sup>3</sup> , Stanford University
43	Cell Intrinsic and Microenvironmental Etiologies of Chemotherapy-Induced White Matter Damage	Alfonso Ocampo <sup>1,2,3,4,6</sup> , Erin M. Gibson <sup>1,2,3,6</sup> , Lauren S. Wood <sup>1,2,3,4</sup> , James Lennon <sup>1,2,3,4</sup> , Surya Nagaraja <sup>1,2,3,4,5</sup> , Pam J. Woo <sup>1,2,3,4</sup> , Hannes Vogel <sup>1,2,3,6</sup> , Michelle Monje <sup>1,2,3,4,6</sup> Departments of Neurology <sup>1</sup> , Neurosurgery <sup>2</sup> , Pediatrics <sup>3</sup> , Neuroscience <sup>5</sup> , and Pathology <sup>6</sup> and Institute for Stem Cell Biology & Regenerative Medicine <sup>4</sup> , Stanford University
44	Subject-Specific Volumetric Reconstruction of Biomechanical Arm Models	Anupama Rajan <sup>1</sup> , Samir Menon <sup>1</sup> Oussama Khatib <sup>1</sup> Department of Computer Science <sup>1</sup> , Stanford University
45	Optogenetic Control of Nerve Growth Factor Mediated Pathways in Spatial Dimensions for PC-12 Cell Differentiation Model	Aliyah Sarro-Schwartz <sup>1</sup> , Qunxiang Ong <sup>1</sup> , Allister McGuire <sup>1</sup> , Ruyan Zhang <sup>1</sup> , Bianxiao Cui <sup>1</sup> Department of Chemistry <sup>1</sup> , Stanford University
46	The Role of Spectrin in T Cell Stiffness and Signaling	Yoseph Semma <sup>1</sup> , Kenneth Hu <sup>2</sup> , Manish Butte <sup>3</sup> Departments of Biology <sup>1</sup> , Biophysics <sup>2</sup> , and Pediatrics <sup>3</sup> , Stanford University
47	Significance of Sleep and Circadian Rhythms in Learning and Memory	Meagan Shinbashi <sup>1</sup> , Amy Xu <sup>1</sup> , Bayara Chuluun <sup>1</sup> , H. Craig Heller <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
48	Optogenetic Stimulation of VTA Dopamine Neurons in DAT-Cre Mice to Induce a Sleep to Wake Transition	Matias Silvestre <sup>1</sup> , Ada Eban-Rothschild <sup>1</sup> , Shubin Li <sup>1</sup> , William Giardino <sup>1</sup> , Luis de Lecea <sup>1</sup> Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University
49	Modeling Familial Dilated Cardiomyopathy with Induced Pluripotent Stem Cells	Zachary Sorey <sup>1</sup> , Ioannis Karakikes <sup>1</sup> , Vittavat Termglinchan <sup>1</sup> , Timon Seeger <sup>1</sup> , Joseph Wu <sup>1</sup> , Patricia Nguyen <sup>1</sup> Cardiovascular Institute <sup>1</sup> , Stanford University
50	Investigating RA-mediated Homeostatic Plasticity <i>in vivo</i>	Sona Sulakian <sup>1</sup> , Lei Ray Zhong <sup>2</sup> , Lu Chen <sup>2</sup> Departments of Chemistry <sup>1</sup> and Neurosurgery <sup>2</sup> , Stanford University
51	Regulating Action Sequence via Basal Ganglia Indirect and Direct Pathway Circuitry	Gordon L. Sun <sup>1</sup> , Patrick E. Rothwell <sup>1</sup> , Robert Malenka <sup>1</sup> Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University
52	Mechanisms of Neuroligin-3 Activity-Dependent Cleavage and Secretion	Lydia Tam <sup>1</sup> , Humsa Venkatesh <sup>1</sup> , Michelle Monje <sup>1</sup> Department of Neurology <sup>1</sup> , Stanford University
53	Fate Mapping of Telomerase Expressing Cells from Neural Stem Cell Niche	Chester Thai <sup>1</sup> , Chandresh Gajera <sup>1</sup> , Steven Artandi <sup>1,2</sup> Departments of Hematology <sup>1</sup> and Biochemistry <sup>2</sup> , Stanford University
54	Risk Factors for the Onset of Depression, Anxiety, and Comorbid Depression-Anxiety: A Longitudinal Investigation	Ada Thatcher-James <sup>1</sup> , Joelle LeMoult <sup>1</sup> , Ian Gotlib <sup>1</sup>

		Department of Psychology <sup>1</sup> , Stanford University
55	Targeting Lipogenesis Suppresses Myc, Ras, and Bcr-Abl Lymphomas	Georgia Toal <sup>1</sup> , Arvin Gouw <sup>1</sup> , Dean W. Felsher <sup>1</sup> Department of Medicine (Division of Oncology) <sup>1</sup> , Stanford University
56	Characterizing the Kinetics of Circulating Tumor DNA Degradation	Jason Wang <sup>1,2</sup> , Alex Lovejoy <sup>2,3</sup> , Jake Chabon <sup>1,2</sup> , Dave Kurtz <sup>4,5</sup> , Maximilian Diehn <sup>1,2,3</sup> Institute for Stem Cell Biology & Regenerative Medicine <sup>1</sup> , Stanford Cancer Institute <sup>2</sup> , Departments of Radiation Oncology <sup>3</sup> , Medicine (Division of Oncology) <sup>4</sup> , and Bioengineering <sup>5</sup> , Stanford University
57	Does <i>Toxoplasma gondii</i> Selectively Shed Surface Proteins from its Plasma Membrane During Host Cell Invasion?	Brian Wei <sup>1</sup> , Felice Kelly <sup>1</sup> , John Boothroyd <sup>1</sup> Department of Microbiology & Immunology <sup>1</sup> , Stanford University
58	A Web-Based Repository of Drug-Induced Cancer Cell Death Phenotypes	Alex Wells <sup>1</sup> , Marisa Hom <sup>1</sup> , Scott Dixon <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
59	Analysis of Global Changes in Synaptic Structure Within Cortical Networks	Drew Willoughby <sup>1</sup> , Marc Carmichael <sup>1</sup> , Theo Palmer <sup>1</sup> Department of Neurosurgery <sup>1</sup> , Stanford University
60	Utilizing Inducible CRISPR Interference for Functional Study of ILF2 & ILF3 in Cell Growth and Proliferation	Timothy Ting-Hsuan Wu <sup>1</sup> , LingFang Shi <sup>1</sup> , Peter N. Kao <sup>1</sup> Department of Medicine (Division of Pulmonary & Critical Care Medicine) <sup>1</sup> , Stanford University
61	Measuring the Methylation State and Accessibility of a Nondisruptable Intergenic Region of <i>Caulobacter crescentus</i>	Johnny Xu <sup>1</sup> , Michael Melfi <sup>2</sup> , Lucy Shapiro <sup>1</sup> Departments of Developmental Biology <sup>1</sup> and Chemistry <sup>2</sup> , Stanford University
62	Developing a Tool for Measurement of Synaptic Vesicle Protein Half-Lives	Leena Yin <sup>1</sup> , Shaoyun Zang <sup>1</sup> , Richard Reimer <sup>1,2</sup> Department of Neurology & Neurological Sciences <sup>1</sup> , Stanford University; Veterans Affairs Palo Alto Health Care System <sup>2</sup>
63	Hsp90 and the Evolution of New Traits	Alex Yuan <sup>1</sup> , Daniel Jarosz <sup>2,3</sup> Departments of Biology <sup>1</sup> , Chemical & Systems Biology <sup>2</sup> , and Developmental Biology <sup>3</sup> , Stanford University
64	The Stimulatory Effect of Bioactive Lipids on Mesoderm Expansion and Cardiomyocyte Cell Cycle Reentry in an hiPSC Model	Yuan Zhang <sup>1,2</sup> , Arun Sharma <sup>1,2</sup> , and Sean M. Wu <sup>1,2,3</sup> Institute for Stem Cell Biology & Regenerative Medicine <sup>1</sup> , Cardiovascular Institute <sup>2</sup> , and Department of Medicine (Division of Cardiovascular Medicine) <sup>3</sup> , Stanford University
65	Understanding the Language of Genomes through Domain Architectures	Isabelle Ziebold <sup>1</sup> , Andrea Scaiewicz <sup>2</sup> , Michael Levitt <sup>2,3</sup> Departments of Biology <sup>1</sup> , Structural Biology <sup>2</sup> , and Computer Science <sup>3</sup> , Stanford University
66	Performance Evaluation of an RF-Penetrable Positron Emission Tomography (PET) Insert for Simultaneous PET/MR Imaging	Chen-Ming Chang <sup>1,2</sup> , Brian J. Lee <sup>2,4</sup> , Alexander M. Grant <sup>2,3</sup> , Ronald Watkins <sup>5</sup> , Gary H. Glover <sup>2,5,6</sup> , Craig S. Levin <sup>2,3,5,6,7</sup> Departments of Applied Physics <sup>1</sup> , Bioengineering <sup>3</sup> , Mechanical Engineering <sup>4</sup> , Radiology <sup>5</sup> , Electrical Engineering <sup>6</sup> , and Physics <sup>7</sup> and Molecular Imaging Program at Stanford (MIPS) <sup>2</sup> , Stanford University
67	Less Efficacious Drugs Lead to Softer Sweeps in HIV-1	Alison F Feder <sup>1</sup> , Soo-Yon Rhee <sup>2</sup> , Robert W. Shafer <sup>2</sup> , Pleuni S. Pennings <sup>1,3</sup> , Dmitri A. Petrov <sup>1</sup> Departments of Biology <sup>1</sup> and Medicine (Division of Infectious Diseases) <sup>2</sup> , Stanford University; Department of Biology <sup>3</sup> , San Francisco State University
68	Complete Biosynthesis of an Opioid Drug in Yeast and Other Alkaloid Transformation	Stephanie Galanie <sup>1</sup> , Kate Thodey <sup>2</sup> , Isis J. Trenchard <sup>2</sup> , Maria Filsinger Interrante <sup>2</sup> , Christina D. Smolke <sup>2</sup>

		Departments of Chemistry <sup>1</sup> and Bioengineering <sup>2</sup> , Stanford University
69	Evolution of Hierarchy in Bacterial Metabolic Networks	Aaron Goodman <sup>1</sup> , Marcus Feldman <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
70	Typicality Sharpens Category Representations in Object-Selective Cortex	Marius Cătălin Iordan <sup>1</sup> , Michelle R. Greene <sup>1</sup> , Diane M. Beck <sup>2,3</sup> , Li Fei-Fei <sup>1</sup> Department of Computer Science <sup>1</sup> , Stanford University; Beckman Institute <sup>2</sup> and Department of Psychology <sup>3</sup> , University of Illinois at Urbana-Champaign
71	Automatic Linac QA: Design and Testing of an Image Acquisition and Processing System Utilizing a Combination of Radioluminescent Phosphors, Embedded X-Ray Markers and Optical Measurements	Cesare Jenkins <sup>1,2</sup> , Dominik Naczynski <sup>1</sup> , Shu-Jung Yu <sup>1</sup> , Yong Yang <sup>1</sup> , Lei Xing <sup>1</sup> Departments of Radiation Oncology <sup>1</sup> and Mechanical Engineering <sup>2</sup> , Stanford University
72	A Cell Type Specific Transcriptional Repressor Directs Selective Upregulation of Terminal Differentiation Program	Jongmin Kim <sup>1</sup> , Margaret T. Fuller <sup>2,3</sup> Departments of Chemical & Systems Biology <sup>1</sup> , Biology <sup>2</sup> , and Genetics <sup>3</sup> , Stanford University
73	MRI Measurements in the Presence of an RF-Penetrable PET Insert for Simultaneous PET/MRI	Brian J. Lee <sup>1</sup> , Alexander M. Grant <sup>1</sup> , Chen-Ming Chang <sup>1</sup> , Ronald Watkins <sup>1</sup> , Gary H. Glover <sup>1</sup> , Craig S. Levin <sup>1</sup> Molecular Imaging Instrumentation Lab <sup>1</sup> , Stanford University
74	Unraveling the Dynamics of Reprogramming of Fibroblasts into Neurons	Qian Yi Lee <sup>1</sup> , Barbara Treutlein <sup>1</sup> , J. Gray Camp <sup>1,2</sup> , Winston Koh <sup>1</sup> , Sopheak Sim <sup>3</sup> , Stephen Quake <sup>1,4</sup> , Marius Wernig <sup>3,5</sup> Departments of Bioengineering <sup>1</sup> , Developmental Biology <sup>2</sup> , Applied Physics <sup>4</sup> , and Pathology <sup>5</sup> and Institute for Stem Cell Biology & Regenerative Medicine <sup>3</sup> , Stanford University
75	Scanning Fiber Technology for Rapid Volumetric Optical Coherence Tomography (OCT) Cystoscopy	Kristen L. Lurie <sup>1,2</sup> , Abhijit A. Gurjarpadhye <sup>1,2</sup> , Eric J. Seibel <sup>3</sup> , Audrey K. Ellerbee <sup>1,2</sup> E.L. Ginzton Laboratory <sup>1</sup> and Department of Electrical Engineering <sup>2</sup> , Stanford University; Department of Mechanical Engineering <sup>3</sup> , University of Washington
76	Repertoire and Role of Gamma-Delta T Cells During Murine Malaria	Murad R. Mamedov <sup>1</sup> , Jose H. M. Oliveira <sup>2</sup> , David S. Schneider <sup>1,2</sup> , Yueh-hsiu Chien <sup>1,2</sup> , Mark M. Davis <sup>1,2,3</sup> Stanford Immunology Program <sup>1</sup> , Department of Microbiology & Immunology <sup>2</sup> , and Howard Hughes Medical Institute <sup>3</sup> , Stanford University
77	Discrete and Continuous Cell States Revealed by Single Cell Sequencing	Geoffrey Stanley <sup>1</sup> , Özgün Gökce <sup>2</sup> , Barbara Treutlein <sup>3</sup> , Stephen Quake <sup>3,4</sup> , Thomas Südhof <sup>2,4</sup> Departments of Biophysics <sup>1</sup> , Molecular & Cellular Physiology <sup>2</sup> , Bioengineering <sup>3</sup> , and Howard Hughes Medical Institute <sup>4</sup> , Stanford University
78	Fluid-Filled Dynamic Bowtie Filter	Picha Shunhavanich <sup>1,2</sup> , Scott S. Hsieh <sup>2</sup> , Norbert J. Pelc <sup>1,2</sup> Departments of Bioengineering <sup>1</sup> and Radiology <sup>2</sup> , Stanford University
79	Safer Treatments, Faster Planning: Convex Optimization in Radiation Therapy	Baris Ungun <sup>1</sup> , Stephen Boyd <sup>2</sup> , Lei Xing <sup>3</sup> Departments of Bioengineering <sup>1</sup> , Electrical Engineering <sup>2</sup> , and Radiation Oncology <sup>3</sup> , Stanford University
80	The Adaptive Mutation Spectrum in Experimentally Evolving Yeast	Sandeep Venkataram <sup>1</sup> , Barbara Dunn <sup>2</sup> , Yuping Li <sup>1,2</sup> , Atish Agarwala <sup>3</sup> , Lucas Herrisant <sup>2</sup> , Kerry Samerotte <sup>1,4</sup> , Jessica Chang <sup>2</sup> , Sasha Levy <sup>1,5</sup> , Jamie Blundell <sup>1,3</sup> , Daniel Fisher <sup>3</sup> , Gavin Sherlock <sup>2</sup> , Dmitri Petrov <sup>1</sup> Departments of Biology <sup>1</sup> , Genetics <sup>2</sup> , and Applied Physics <sup>3</sup> , Stanford University; Department of

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81	Effects of Biochemical and Mechanical Niche Cues on Mesenchymal Stem Cell Chondrogenesis in a 3D Hydrogel Platform	Tianyi Wang <sup>1</sup> , Fan Yang <sup>1,2</sup> Departments of Bioengineering <sup>1</sup> and Orthopaedic Surgery <sup>2</sup> , Stanford University
82	An RNA-Based, Generalizable Synthetic Genetic Controller for Dynamic Regulation	Yen-Hsiang Wang <sup>1</sup> , Christina Smolke <sup>1</sup> Department of Bioengineering <sup>1</sup> , Stanford University
83	Using an Instrumented Mouthguard and High Speed Eye Tracking to Study Kinematic Dose and Neurological Response in Contact Sports	Lyndia C. Wu <sup>1</sup> , Jianliang Tong <sup>2</sup> , Jessica A. Little <sup>3</sup> , Jake M. Hartley <sup>3</sup> , Connie Ju <sup>3</sup> , Brian Tang <sup>3</sup> , Jamshid Ghajar <sup>2,3</sup> , David B. Camarillo <sup>1</sup> Departments of Bioengineering <sup>1</sup> and Neurosurgery <sup>3</sup> and Brain Trauma Foundation <sup>2</sup> , Stanford University
84	Utilization of In-depth Photon Counting Detectors Towards X-ray Spectral Imaging: the Benefits from the Depth Information	Yuan Yao <sup>1,2</sup> , Hans Bornefalk <sup>4</sup> , Scott S. Hsieh <sup>2</sup> , Mats Danielsson <sup>4</sup> , Norbert J. Pelc <sup>1,2,3</sup> Departments of Bioengineering <sup>1</sup> , Radiology <sup>2</sup> , and Electrical Engineering <sup>3</sup> , Stanford University; Department of Physics <sup>4</sup> , Royal Institute of Technology, Stockholm, Sweden
85	Omics Analysis System for Precision Oncology (OASISPRO): A Web-Based Tool for Tumor Omics Analysis	Kun-Hsing Yu <sup>1,2</sup> , Michael Fitzpatrick <sup>3</sup> , Luke Pappas <sup>3</sup> , Jessica Kung <sup>3</sup> , Michael Snyder <sup>2</sup> Biomedical Informatics Program <sup>1</sup> and Departments of Genetics <sup>2</sup> and Computer Science <sup>3</sup> , Stanford University
86	Cloud Experimentation for Biology: Systems Architecture and Utility for Online Education and Research	Zahid Hossain <sup>2</sup> , Xiaofan Jin <sup>1</sup> , Engin Bumbacher <sup>3</sup> , Alice Chung <sup>1</sup> , Stephen Koo <sup>2</sup> , Jordan Shapiro <sup>1</sup> , Cynthia Truong <sup>1</sup> , Sean Choi <sup>2</sup> , Nathan Orloff <sup>1</sup> , Paulo Blikstein <sup>3</sup> , Ingmar Riedel-Kruse <sup>1</sup> Departments of Bioengineering <sup>1</sup> and Computer Science <sup>2</sup> and School of Education <sup>3</sup> , Stanford University
87	Modularity of a Feedforward Motif in the Pheromone Signaling Pathway	Oguzhan Atay <sup>1</sup> , Andreas Doncic <sup>1</sup> , Daniel S. Fisher <sup>1,2</sup> , Jan M. Skotheim <sup>1</sup> Departments of Biology <sup>1</sup> and Applied Physics <sup>2</sup> , Stanford University
88	The Minimal Cadherin-Catenin Complex Binds to Actin Filaments under Force	Craig D. Buckley <sup>1</sup> , Jiongyi Tan <sup>2</sup> , Karen L. Anderson <sup>3</sup> , Dorit Hanein <sup>3</sup> , Niels Volkmann <sup>3</sup> , William I. Weis <sup>2,4,5</sup> , W. James Nelson <sup>5,6</sup> , Alexander R. Dunn <sup>1,2,7</sup> Departments of Chemical Engineering <sup>1</sup> , Structural Biology <sup>4</sup> , Molecular & Cellular Physiology <sup>5</sup> , and Biology <sup>6</sup> , Biophysics Program <sup>2</sup> , and Stanford Cardiovascular Institute <sup>7</sup> , Stanford University; Bioinformatics & Structural Systems Biology Program <sup>3</sup> , Sanford-Burnham Medical Research Institute
89	Dynamic <i>N</i> <sup>6</sup> -Methyladenosine Modification of mRNA Disrupts Translation Elongation Dynamics	Junhong Choi <sup>1,2</sup> , Ka-Weng Jeong <sup>3</sup> , Hasan Demirci <sup>4,5</sup> , Jin Chen <sup>1,2</sup> , Måns Ehrenberg <sup>3</sup> , Joseph D. Puglisi <sup>1</sup> Departments of Structural Biology <sup>1</sup> and Applied Physics <sup>2</sup> , Stanford University; Department of Cell & Molecular Biology <sup>3</sup> , Biomedical Center, Uppsala University; Stanford PULSE Institute <sup>4</sup> and Stanford Synchrotron Radiation Lightsource <sup>5</sup> , SLAC National Accelerator Laboratory
90	“Seeing” Subcellular Structures: Quantifying Microtubule Organization with a Confocal Microscope and a Computer	Roshni Cooper <sup>1</sup> , Shaul Yogev <sup>2</sup> , Mark Horowitz <sup>1</sup> , Kang Shen <sup>2</sup> Departments of Electrical Engineering <sup>1</sup> and Biology <sup>2</sup> , Stanford University

91	Investigating the Mechanical Response of Human Embryonic Stem Cells with a Tunable Matrigel-Polyacrylamide Composite	Andrew J. Price <sup>1</sup> , Eva Yi-Hsuan Huang <sup>2</sup> , Vittorio Sebastiano <sup>3</sup> , Alexander R. Dunn <sup>1,2</sup> Biophysics Program <sup>1</sup> and Departments of Chemical Engineering <sup>2</sup> and Obstetrics & Gynecology <sup>3</sup> , Stanford University
92	Development and Application of High-Resolution Multimodal Methods for Investigating the Dynamics of Nucleoprotein Machines	Ivan E. Ivanov <sup>1</sup> , Paul Lebel <sup>2</sup> , Athena Ierokomos <sup>3</sup> , Zev Bryant <sup>4</sup> Departments of Chemical Engineering <sup>1</sup> , Applied Physics <sup>2</sup> , Biophysics <sup>3</sup> , and Bioengineering <sup>4</sup> , Stanford University
93	Engineering Patterned Biofilms for Microbial Consortia	Xiaofan Jin <sup>1</sup> , Ingmar Riedel-Kruse <sup>1</sup> Department of Bioengineering <sup>1</sup> , Stanford University
94	Biophysics of Swimming and Host-Seeking in <i>Schistosomiasis cercariae</i>	Deepak Krishnamurthy <sup>1</sup> , Arjun Bhargava <sup>2</sup> , Georgios Katsikis <sup>1</sup> , Manu Prakash <sup>3</sup> Departments of Mechanical Engineering <sup>1</sup> , Applied Physics <sup>2</sup> , and Bioengineering <sup>3</sup> , Stanford University
95	Role of Sall4 in the Transition from Embryonic Stem Cell to Differentiated States	Ye Henry Li <sup>1,2</sup> , Pedro Batista <sup>3</sup> , Eli Zunder <sup>4</sup> , Howard Chang <sup>3</sup> , Garry Nolan <sup>4</sup> , Wing Hung Wong <sup>5</sup> Departments of Structural Biology <sup>1</sup> , Cancer Biology <sup>3</sup> , Microbiology & Immunology <sup>4</sup> , and Statistics <sup>5</sup> and Public Policy Program <sup>2</sup> Stanford University
96	Evaluation of Multiple Statistical Approaches for CyTOF Exploration	Xiaowei Wang <sup>1</sup> , Ye Henry Li <sup>2,3</sup> , Dangna Li <sup>4</sup> , Wing Hung Wong <sup>5</sup> School of Mathematical Sciences <sup>1</sup> , Peking University; Departments of Structural Biology <sup>2</sup> and Statistics <sup>5</sup> , Public Policy Program <sup>3</sup> , and Institute for Computational & Mathematical Engineering <sup>4</sup> , Stanford University
97	A High-Throughput, Multipurpose Microcapillary Platform Technology for Engineering High Affinity Protein-Protein Interactions	Sungwon Lim <sup>1</sup> , Bob Chen <sup>1</sup> , Mihalis S. Kariolis <sup>2</sup> , Ivan Dimov <sup>3</sup> , Thomas M. Baer <sup>4</sup> , Jennifer R. Cochran <sup>1,5</sup> Departments of Bioengineering <sup>1</sup> , Radiation Oncology <sup>2</sup> , and Chemical Engineering <sup>5</sup> , Institute for Stem Cell Biology & Regenerative Medicine <sup>3</sup> , and Stanford Photonics Research Center <sup>4</sup> , Stanford University
98	Electrochemical Monitoring of the Cell-Nanoelectrode Interface	Allister McGuire <sup>1</sup> , Francesca Santoro <sup>1</sup> , Ziliang Carter Lin <sup>2</sup> , Yi Cui <sup>3</sup> , Bianxiao Cui <sup>1</sup> Departments of Chemistry <sup>1</sup> , Applied Physics <sup>2</sup> , and Materials Science & Engineering <sup>3</sup> , Stanford University
99	Role of Septate Junctions During Homeostatic Cell Turnover of the Adult <i>Drosophila</i> Midgut	Paola Moreno-Roman <sup>1</sup> , Lucy O'Brien <sup>2</sup> Departments of Biology <sup>1</sup> and Molecular & Cellular Physiology <sup>2</sup> , Stanford University
100	Developmental Phosphoproteomics Identifies CK2 as a Novel Therapeutic Target in Medulloblastoma	Teresa Purzner <sup>1</sup> , Steve Gygi <sup>2</sup> , Josh Elias <sup>3</sup> , Matthew P. Scott <sup>1,4</sup> , Yoon-Jae Cho <sup>5,6</sup> Departments of Developmental Biology <sup>1</sup> , Systems Biology <sup>3</sup> , Neurology <sup>5</sup> , and Neurosurgery <sup>6</sup> , Stanford University; Department of Cell Biology <sup>2</sup> , Harvard University; Carnegie Institute of Science <sup>4</sup>
101	Repurposing of Chromatin Regulators in Epidermal Neoplasia	Adam Rubin <sup>1,2</sup> , Brook Barajas <sup>2</sup> , Lisa Zaba <sup>2</sup> , Howard Chang <sup>2</sup> , Paul Khavari <sup>2</sup> Program in Stem Cell Biology & Regenerative Medicine <sup>1</sup> and Program in Epithelial Biology <sup>2</sup> , Stanford University
102	Exploratory Study of Atherosclerotic Plaque Using Synchrotron X-Ray Diffraction	Herbert Silva <sup>1</sup> , Drew Nelson <sup>1</sup> , Chris Tassone <sup>2</sup> , Elsie Gyang <sup>3</sup> , Jason Lee <sup>3</sup> Departments of Mechanical Engineering <sup>1</sup> and



		Vascular Surgery <sup>3</sup> and SLAC Synchrotron Radiation Lab <sup>2</sup> , Stanford University
103	Prospective Changes in the Knee Joint Center of Rotation Relative to the Contralateral Knee and Over Time Provide a Comprehensive View of Kinematic Changes Following Anterior Cruciate Ligament Reconstruction	Matthew R Titchenal <sup>1,2,3</sup> , Constance R Chu <sup>2,3</sup> , Thomas P Andriacchi <sup>1,2,3</sup> Departments of Mechanical Engineering <sup>1</sup> and Orthopaedic Surgery <sup>3</sup> , Stanford University; Veterans Affairs Palo Alto Health Care System <sup>2</sup>
104	Understanding Hedgehog Signaling, One Molecule at a Time	Lucien E. Weiss <sup>1</sup> , Ljiljana Milenkovic <sup>2</sup> , Josh Y. Yoon <sup>1</sup> , Matthew P. Scott <sup>3</sup> , Tim Stearns <sup>2</sup> , W. E. Moerner <sup>1</sup> Departments of Chemistry <sup>1</sup> and Biology <sup>2</sup> , Stanford University; Carnegie Institution for Science <sup>3</sup>
105	Towards Field Identification of Mosquitoes via Mobile Phone Based Acoustics Classification	Erica Castillo <sup>1</sup> , Haripriya Mukundarajan <sup>1</sup> , Cooper Newby <sup>1</sup> , Manu Prakash <sup>2</sup> Departments of Mechanical Engineering <sup>1</sup> and Bioengineering <sup>2</sup> , Stanford University
106	Cyclic Strain of the Thoracic Aorta Before and After Endograft Implantation	Sarah Cabrereros <sup>1</sup> , Ga-Young Kelly Suh <sup>2</sup> , Ronald L. Dalman <sup>2</sup> , Christopher P. Cheng <sup>2</sup> Departments of Mechanical Engineering <sup>1</sup> and Surgery <sup>2</sup> , Stanford University
107	Optimization of Geometric Modeling of Human Thoracic Aorta	Yufei D. Zhu <sup>1</sup> , Ga-Young Kelly Suh <sup>1</sup> , Christopher P. Cheng <sup>1</sup> Department of Surgery <sup>1</sup> , Stanford University
108	Geometric Analysis of the Renal Arteries and Aorta with Complex Endovascular Aortic Aneurysm Repair	John Kim <sup>1</sup> , Ga-Young Kelly Suh <sup>2</sup> , Jason T. Lee <sup>2</sup> , Ronald L. Dalman <sup>2</sup> , Christopher P. Cheng <sup>2</sup> Department of Biology <sup>1</sup> , University of Chicago; Department of Surgery <sup>2</sup> , Stanford University
109	RF Cell-Tags for Intracellular Biological Sensing	Xiaolin Hu <sup>1</sup> , Mimi Yang <sup>1</sup> , Kokab Parizi <sup>1</sup> , Xiaoqing Xu <sup>1</sup> , Wenye Li <sup>1</sup> , Demir Akin <sup>2</sup> , Michael McConnell <sup>3</sup> , Ada Poon <sup>1</sup> , H.-S. Philip Wong <sup>1</sup> Departments of Electrical Engineering <sup>1</sup> and Medicine (Division of Cardiovascular Medicine) <sup>3</sup> and CCNE-TR <sup>2</sup> , Stanford University
110	Pancreatic Cancer Modeling Using Retrograde Viral Vector Delivery and <i>in vivo</i> CRISPR/Cas9-Mediated Somatic Genome Editing	Shin-Heng Chiou <sup>1</sup> , Ian P. Winters <sup>1</sup> , Jing Wang <sup>5,6</sup> , Santiago Naranjo <sup>1</sup> , Hong Zeng <sup>4,8</sup> , Pauline Chu <sup>7</sup> , Grace E. Kim <sup>9</sup> , Seung K. Kim <sup>5,6</sup> , Monte M. Winslow <sup>1,2,3,4</sup> Departments of Genetics <sup>1</sup> , Pathology <sup>2</sup> , Developmental Biology <sup>5</sup> , and Comparative Medicine <sup>7</sup> and Cancer Biology Program <sup>3</sup> , Stanford Cancer Institute <sup>4</sup> , Howard Hughes Medical Institute <sup>6</sup> , and Transgenic, Knockout, & Tumor Model Center <sup>8</sup> , Stanford University; Department of Pathology <sup>9</sup> , University of California San Francisco
111	Chloroplasts in the Maize Anther Endothecium	Katherine M. Murphy <sup>1</sup> , Rachel L. Egger <sup>1</sup> , Virginia Walbot <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
112	Defining and Identifying Autism Resource Gaps	Nikhila Albert <sup>1</sup> , Jena Daniels <sup>2</sup> , Byron Hinebaugh <sup>2</sup> , Dennis Wall <sup>2</sup> Department of Computer Science <sup>1</sup> , Princeton University; Department of Pediatrics <sup>2</sup> , Stanford University
113	Inhibitory Synapses Are Essential for Gamma Frequency Neuronal Oscillations, But the Time Course of Inhibition Does Not Contribute to Oscillation Frequency	M.B. MacIver <sup>1</sup> Department of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> , Stanford University
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115	Subcellular Recruitment of Endocytosis Machinery by Nanostructure-Induced Membrane Curvatures	Wenting Zhao <sup>1</sup> , Lindsey Hanson <sup>2</sup> , Praveen Chowdary <sup>2</sup> , Jessica Marks <sup>3</sup> , Alexandre Grassart <sup>3</sup> , David G. Drubin <sup>3</sup> , Yi Cui <sup>1,4#</sup> , Bianxiao Cui <sup>2#</sup>

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116	The Development of Modified Saxitoxins for Studies of NaV Channel Regulation	Darren Finkelstein <sup>1</sup> , Arun Thottumkara <sup>1</sup> , Luke Kaplan <sup>1</sup> , Bianxiao Cui <sup>1</sup> , J. Du Bois <sup>1</sup> Department of Chemistry <sup>1</sup> , Stanford University
117	What Stabilizes the Ectomycorrhizal Mutualism? An Experimental Test of Partner Choice by <i>Pinus muricata</i> in Association with <i>Suillus brevipes</i>	Laura Bogar <sup>1</sup> , Kabir Peay <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
118	Assessing Coprophilous Fungal Succession in Tule Elk Dung: Molecular vs. Culture Methods	Nora Dunkirk <sup>1</sup> , Jason Stajich <sup>2</sup> , Kabir Peay <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University; Department of Plant Pathology & Microbiology <sup>2</sup> , University of California, Riverside
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120	Pushing Single Cell Scanning Electron Microscopy to the Limit	Francesca Santoro <sup>1</sup> , Wenting Zhao <sup>1,2</sup> , Allister McGuire <sup>1</sup> , Hsyn-Ya Lou <sup>1</sup> , Bianxiao Cui <sup>1</sup> Departments of Chemistry <sup>1</sup> and Materials Science & Engineering <sup>2</sup> , Stanford University
121	Optical BioSensor for Detecting Markers of Traumatic Brain Injury	Fariah Mahzabeen <sup>1</sup> , Jelena Levi <sup>2,4</sup> , James L. Zehnder <sup>3</sup> , Sanjiv S. Gambhir <sup>2,4</sup> , James S. Harris <sup>1</sup> Departments of Electrical Engineering <sup>1</sup> , Radiology <sup>2</sup> , and Hematology <sup>3</sup> and Canary Center for Cancer Early Detection <sup>4</sup> , Stanford University
122	Signal Quality of Endovascular Electroencephalography	Bryan D. He <sup>1,2,3*</sup> , Mosalam Ebrahimi <sup>1,2*</sup> , Leon Palafox <sup>1,2</sup> , Lakshminarayan Srinivasan <sup>1,2</sup> (*equal contribution) Neural Signal Processing Laboratory <sup>1</sup> and Department of Radiology <sup>2</sup> , Stanford University; Department of Computer Science <sup>3</sup> , California Institute of Technology
123	Feedback of Respiratory Patterns to Improve Non-Sedated Pediatric MRI	Shreyan Jain <sup>1</sup> , Joseph Cheng <sup>1</sup> , Tao Zhang <sup>1</sup> , Shreyas Vasanaawala <sup>1</sup> Department of Radiology <sup>1</sup> , Stanford University
124	Exosomes as a Mechanism of Small RNA-Mediated Intercellular Communication in the Enteric Parasite <i>Entamoeba histolytica</i>	Pedro Morgado <sup>1</sup> , Upinder Singh <sup>1,2</sup> Departments of Medicine (Division of Infectious Diseases) <sup>1</sup> and Microbiology & Immunology <sup>2</sup> , Stanford University
125	Use of Machine Learning for Behavioral Distinction of Autism and ADHD	Marlena Duda <sup>1</sup> , Ralph Ma <sup>1</sup> , Nick Haber <sup>1</sup> , Dennis P. Wall <sup>1</sup> Department of Pediatrics (Division of Systems Medicine) <sup>1</sup> , Stanford University
126	AAK1 and GAK Regulate Intracellular Viral Trafficking and Are Potential Targets for Broad-Spectrum Antivirals	Elena Bekerman <sup>1</sup> , Gregory Neveu <sup>1</sup> , Jennifer Brannan <sup>2</sup> , Ana Shulla <sup>3</sup> , Szu-Yuan Pu <sup>1</sup> , Claude Nagamine <sup>4</sup> , Glenn Randall <sup>3</sup> , John Dye <sup>2</sup> , Shirit Einav <sup>1</sup> Departments of Medicine (Infectious Diseases) <sup>1</sup> and Comparative Medicine <sup>4</sup> , Stanford University; US Army Medical Research Institute of Infectious Diseases <sup>2</sup> ; Department of Microbiology <sup>3</sup> , the University of Chicago
127	Development of Theta Rhythm in Hippocampal Formation Slices Perfused with 5-HT1A Antagonist, (S)WAY 100135	Paulina D. Kaźmierska <sup>1,2</sup> , Jan Konopacki <sup>2</sup> , M. Bruce MacIver <sup>1</sup> Department of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> , Stanford University; Department

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128	Chemical Inhibition of Apicoplast Replication in Malaria Parasites	Katherine Amberg-Johnson <sup>1</sup> , Ellen Yeh <sup>2</sup> Departments of Microbiology & Immunology <sup>1</sup> and Biochemistry <sup>2</sup> , Stanford University
129	Telomere Extension Using Nucleoside-Modified mRNA and Exosomes as a Novel Therapeutic Tool	John Ramunas <sup>1*</sup> , Eduard Yakubov <sup>2*</sup> , Colin Holbrook <sup>1</sup> , John P. Cooke <sup>2</sup> , and Helen M. Blau <sup>1</sup> (*equal contribution) Baxter Laboratory for Stem Cell Biology <sup>1</sup> , Stanford University; Center for Cardiovascular Regeneration <sup>2</sup> , Methodist Hospital Research Institute, Houston
130	New Diagnostic Technology Based on Cell-Imprinted Polymers and Anharmonic Detection Technique	Niloufar Hosseini Nassab <sup>1</sup> , Maria Dulay <sup>1</sup> , Kangning Ren <sup>2</sup> , Sourav Gosh <sup>3</sup> , Richard Zare <sup>1</sup> Department of Chemistry <sup>1</sup> , Stanford University; Department of Chemistry <sup>2</sup> , Hong Kong Baptist University; School of Mechanical & Manufacturing Engineering <sup>3</sup> , Loughborough University, England
131	Abnormal Eye Movement Behavior During Reading in Parkinson's Disease	Caroline Yu <sup>1</sup> , Timothy Lee <sup>1</sup> , M. Ali Shariati <sup>1</sup> , Y. Joyce Liao <sup>1</sup> Department of Ophthalmology <sup>1</sup> , Stanford University
132	High-Resolution Lineage Mapping of Myogenesis <i>in vivo</i>	Ermelinda Porpiglia <sup>1</sup> , Ben Cosgrove <sup>1</sup> , Sean Bendall <sup>2</sup> , Wendy J. Fantl <sup>2</sup> , Garry P. Nolan <sup>2</sup> , Helen M. Blau <sup>1</sup> Baxter Laboratory for Stem Cell Biology <sup>1</sup> and Department of Microbiology & Immunology <sup>2</sup> , Stanford University
133	3D Super-Resolution Fluorescence Microscopy with the Corkscrew Point Spread Function	Maurice Y. Lee <sup>1</sup> , Matthew D. Lew <sup>2</sup> , W. E. Moerner <sup>3</sup> Biophysics Program <sup>1</sup> and Department of Chemistry <sup>3</sup> , Stanford University; Department of Electrical & Systems Engineering <sup>2</sup> , Washington University
134	Quantitative Analysis of Multivariate Changes in Frequency and Marker Expression in Cell Subsets	Darya Orlova <sup>1</sup> , Shanel Tsuda <sup>1</sup> , Stephen Meehan <sup>2</sup> , Noah Zimmerman <sup>2</sup> , Connor Meehan <sup>3</sup> , Jeffrey Waters <sup>1</sup> , Eliver Ghosn <sup>1</sup> , Alex Filatenkov <sup>4</sup> , Gleb Kolyagin <sup>5</sup> , Guenther Walther <sup>2</sup> , Leonore Herzenberg <sup>1</sup> Departments of Genetics <sup>1</sup> , Statistics <sup>2</sup> , and Division of Immunology & Rheumatology <sup>4</sup> , Stanford University; Department of Mathematics <sup>3</sup> , California Institute of Technology; work was done without affiliation to any institution <sup>5</sup>
135	Desorption/Ionization Droplet Delivery Mass Spectrometry for High-Resolution Single-Cell Analysis and Imaging	Jae Kyoo Lee <sup>1,2</sup> , Hong Gil Nam <sup>2</sup> , Richard N. Zare <sup>1</sup> Department of Chemistry <sup>1</sup> , Stanford University; Center for Plant Aging Research <sup>2</sup> , Institute for Basic Science, Daegu Gyeongbuk Institute of Science & Technology, Daejeon, Korea
136	Moving Beyond Tension: Epithelium Reorganization in Response to Shear Stress	Ehsan Sadeghipour <sup>1*</sup> , Miguel Garcia <sup>2*</sup> , James W. Nelson <sup>2</sup> , Beth Pruitt <sup>1</sup> (*equal contribution) Departments of Mechanical Engineering <sup>1</sup> and Biological Sciences <sup>2</sup> , Stanford University
137	Randomized, Controlled, Blinded, Pilot Study Using an Oral Food Supplement in Infants at Risk for Food Allergy, to Assess Food Allergy Prevention	Efren Rael <sup>1,2,3</sup> , Kari Nadeau <sup>1,2,3</sup> Sean N. Parker Center for Allergy & Asthma Research <sup>1</sup> and Departments of Medicine (Division of Pulmonary, Allergy, & Critical Care Medicine) <sup>2</sup> and Pediatrics (Division of Allergy, Immunology, & Rheumatology) <sup>3</sup> , Stanford University

138	Solid-State NMR Studies of Bacterial Cell Walls: Peptidoglycan and Teichoic Acids in <i>S. aureus</i>	Joseph A. H. Romaniuk <sup>1</sup> , David Rice <sup>1</sup> , Lynette Cegelski <sup>1</sup> Department of Chemistry <sup>1</sup> , Stanford University
139	Utility of Ferumoxytol as an MR Contrast Agent for Monitoring Anti-CD47 Treatment	Jim Q. Ho <sup>1,2</sup> , Saeid Zanganeh <sup>1,2</sup> , Olga D. Lenkov <sup>1,2</sup> , Rogelio Esparza <sup>3,4</sup> , Suzana Kahn <sup>3,4</sup> , Samuel Cheshier <sup>3,4</sup> , Heike E. Daldrup-Link <sup>1,2</sup> Departments of Radiology <sup>1</sup> and Neurosurgery <sup>3</sup> , Molecular Imaging Program at Stanford (MIPS) <sup>2</sup> , Institute for Stem Cell Biology & Regenerative Medicine <sup>4</sup> , Stanford University
140	Developmental Expression of Opioid Receptors in Sensory Neural Circuits	Sarah Low <sup>1,2,3</sup> , Chaudy Sotoudeh <sup>1,2,3</sup> , Andrew Shuster <sup>1,2,3</sup> , Gregory Scherrer <sup>1,2,3</sup> Departments of Anesthesiology, Perioperative, & Pain Medicine <sup>1</sup> and Molecular & Cellular Physiology <sup>2</sup> and Stanford Neurosciences Institute <sup>3</sup> , Stanford University
141	Protein Trafficking to the Apicoplast in <i>Plasmodium falciparum</i>	Michael J. Boucher <sup>1,2</sup> , Wandy L. Beatty <sup>4</sup> , Ellen Yeh <sup>1,2,3</sup> Departments of Microbiology & Immunology <sup>1</sup> , Biochemistry <sup>2</sup> , and Pathology <sup>3</sup> , Stanford University; Department of Molecular Microbiology <sup>4</sup> , Washington University School of Medicine
142	Improving the Identification of Neonatal Encephalopathy: Utility of a Web-Based Video Tool	Autumn Ivy <sup>1</sup> , Sarah Bahm <sup>2</sup> , Catherine Clark <sup>3</sup> , Krisa van Meurs <sup>2,3</sup> , Courtney Jane Wusthoff <sup>1,3</sup> Division of Child Neurology <sup>1</sup> , Department of Pediatrics <sup>2</sup> , Division of Neonatology <sup>3</sup> , Stanford University
143	Diabetes Impacts Brain Structure in Patients Undergoing Carotid Artery Interventions	Elizabeth Hitchner <sup>1</sup> , Shruti Rao <sup>1</sup> , Salil Soman <sup>3</sup> , Wei Zhou <sup>1,2</sup> Veterans Affairs Palo Alto Health Care System <sup>1</sup> ; Department of Vascular Surgery <sup>2</sup> , Stanford University; Department of Radiology <sup>3</sup> , Harvard Medical School
144	Acute Formation of Aberrant Excitatory Connections onto Pyramidal Cells Following Neocortical Injury	Feng Gu <sup>1</sup> , Isabel Parada <sup>1</sup> , D. Koji Takahashi <sup>1</sup> , David A. Prince <sup>1</sup> Department of Neurology & Neurological Sciences <sup>1</sup> , Stanford University
145	Direct Analysis of Drugs in Blood Samples by Polymer Spray Mass Spectrometry	Maria T. Dulay <sup>1</sup> , Livia S. Eberlin <sup>1</sup> , Richard N. Zare <sup>1</sup> Department of Chemistry <sup>1</sup> , Stanford University
146	Malaria Prenylation: Uncovering New Parasite Biology	Jolyn Gisselberg <sup>1</sup> , Nathan Westcott <sup>2</sup> , Howard Hang <sup>2</sup> , Ellen Yeh <sup>1</sup> Department of Biochemistry <sup>1</sup> , Stanford University; Laboratory of Chemical Biology & Microbial Pathogenesis <sup>2</sup> , The Rockefeller University, New York
147	Force Analysis of FLIM-FRET Images from Developing Zebrafish	Melanie Malinas <sup>1</sup> , Andrea Hamilton <sup>1</sup> , Romain Madelaine <sup>2</sup> , Diego Ramallo <sup>3</sup> , Honesty Kim <sup>1</sup> , Angela Barth <sup>1</sup> , Alex Dunn <sup>3</sup> , Ingmar Riedel-Kruse <sup>1</sup> Departments of Bioengineering <sup>1</sup> , Psychiatry & Behavioral Sciences <sup>2</sup> , and Chemical Engineering <sup>3</sup> , Stanford University
148	3D Matrix Stiffness Regulates Chromatin Organization	Ryan Stowers <sup>1</sup> , Ovijit Chaudhuri <sup>1</sup> Department of Mechanical Engineering <sup>1</sup> , Stanford University
149	An Aversive Input to the Nucleus Accumbens Is Required for Opiate Dependence	Yingjie Zhu <sup>1</sup> , Carl Wienecke <sup>1</sup> , Gregory Nachtrab <sup>1</sup> , Xiaoke Chen <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
150	Pilot Study of Diffusion Weighted Magnetic Resonance Imaging to Identify Spermatogenesis	Michael L. Eisenberg <sup>1</sup> , Valentina Taviani <sup>2</sup> , Tandy Aye <sup>3</sup> , William Kennedy <sup>1</sup> , Shreyas Vasanaawala <sup>2</sup> Departments of Urology <sup>1</sup> , Radiology <sup>2</sup> , and

		Pediatrics <sup>3</sup> , Stanford University
151	A Drug Repositioning Approach for Pancreatic Cancer Treatment	Ramya Keerthi Pasupuleti <sup>1</sup> , Pawel K Mazur <sup>1</sup> , Julien Sage <sup>1</sup> Departments of Pediatrics <sup>1</sup> , Stanford University
152	<i>CDKN2B</i> Regulates Efferocytosis and Phenotypic Switching in Atherosclerosis	Daniel DiRenzo <sup>1,2</sup> , Yoko Kojima <sup>1,2</sup> , Vivek Nanda <sup>1,2</sup> , Nicholas J. Leeper <sup>1,2</sup> Department of Surgery <sup>1</sup> and Stanford Cardiovascular Institute <sup>2</sup> , Stanford University
153	<i>CDKN2B</i> Regulates <i>TGFβ1</i> Mediated Smooth Muscle Cell Recruitment to Ischemic Blood Vessels	Vivek Nanda <sup>1</sup> , Kelly P. Downing <sup>1</sup> , Yoko Kojima <sup>1</sup> , Daniel M. DiRenzo <sup>1</sup> , Shannon D. Brady <sup>1</sup> , Joshua M. Spin <sup>2</sup> , Andrew J. Connolly <sup>3</sup> , Sonny Dandona <sup>4</sup> , Ljubica Perisic <sup>5</sup> , Ulf Hedin <sup>5</sup> , Lars Maegdefessel <sup>6</sup> , Jessie Dalman <sup>1</sup> , Liang Guo <sup>7</sup> , XiaoQing Zhao <sup>7</sup> , Frank D. Kolodgie <sup>7</sup> , Renu Virmani <sup>7</sup> , Harry R. Davis Jr. <sup>7</sup> , Nicholas J. Leeper <sup>1,2</sup> Departments of Surgery <sup>1</sup> , Medicine <sup>2</sup> , and Pathology <sup>3</sup> Stanford University; Department of Medicine <sup>4</sup> , McGill University, Montreal, Canada; Departments of Molecular Medicine & Surgery <sup>5</sup> and Medicine <sup>6</sup> , Karolinska Institute, Stockholm, Sweden; CVPath Institute <sup>7</sup> , Gaithersburg, Maryland
154	Effect of a Changing in Aboveground Plant Community on Soil Properties and Microorganism Communities	Marie Duhamel <sup>1</sup> , Kabir Peay <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
155	Building a Cellular Switch with the Prozone Effect	Sanghoon Ha <sup>1</sup> , James E. Ferrell Jr. <sup>1,2</sup> Departments of Chemical & Systems Biology <sup>1</sup> and Biochemistry <sup>2</sup> , Stanford University
156	The Differential Role of Calcium on Glutamatergic and GABAergic Synaptic Transmission	Beza A Dagne <sup>1</sup> , Melis K. Sunay <sup>1</sup> , Anand Rajagopal <sup>1</sup> , Bruce MacIver <sup>1</sup> Department of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> , Stanford University
157	A Hardware-Accelerated Programming System for Sequence Homology Search	Yatish Turakhia <sup>1</sup> , Albert Ng <sup>1</sup> , William Dally <sup>1,2</sup> , Gill Bejerano <sup>2,3</sup> Departments of Electrical Engineering <sup>1</sup> , Computer Science <sup>2</sup> , and Developmental Biology <sup>3</sup> , Stanford University
158	Gamma Radiation Effects on CNS Circuit Function Provide a Mechanism for Antidepressant Action	Melis K. Sunay <sup>1</sup> , Beza A. Dagne <sup>1</sup> , Spencer Orbegozo <sup>1</sup> , Gabriella Bertaccini <sup>1</sup> , Hiroshi Doi <sup>2</sup> , Rona G. Giffard <sup>1</sup> , Susan J. Knox <sup>2</sup> , M. Bruce MacIver <sup>1</sup> Departments of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> and Radiation Oncology <sup>2</sup> , Stanford University
159	Light-Controlled Activation of Raf/ERK and AKT Reveals Distinctive Roles in Preconditioning Against H <sub>2</sub> O <sub>2</sub> -Induced Oxidative Stress	Qunxiang Ong <sup>1</sup> , Kai Zhang <sup>2</sup> , Shunling Guo <sup>1</sup> , Liting Duan <sup>1</sup> , Eleanor Collier <sup>1</sup> , Bianxiao Cui <sup>1</sup> Department of Chemistry <sup>1</sup> , Stanford University; Department of Biochemistry <sup>2</sup> , University of Illinois at Urbana-Champaign
160	Promotion of Bone Formation by Macrophages	Florence Loi <sup>1</sup> , Luis A. Córdova <sup>1,2</sup> , Jukka Pajarinen <sup>1</sup> , Tzu-hua Lin <sup>1</sup> , Zhenyu Yao <sup>1</sup> , Stuart Goodman <sup>1,3</sup> Departments of Orthopaedic Surgery <sup>1</sup> and Bioengineering <sup>3</sup> , Stanford University; Department of Oral & Maxillofacial Surgery <sup>2</sup> , University of Chile
161	Autism Glass	Azar Fazel <sup>1</sup> , Catalin Voss <sup>2</sup> , Nick Haber <sup>3</sup> , Catherine Xu <sup>2</sup> , Terry Winograd <sup>2</sup> , Carl Feinstein <sup>4</sup> , Dennis Wall <sup>3</sup> Departments of Electrical Engineering <sup>1</sup> , Computer Science <sup>2</sup> , Pediatrics <sup>3</sup> , and Psychiatry & Behavioral Sciences <sup>4</sup> , Stanford University

162	Electro-Responsive Polymers for Drug Delivery	Devleena Samanta <sup>1</sup> , Niloufar Hosseini Nassab <sup>1</sup> , Richard Zare <sup>1</sup> Department of Chemistry <sup>1</sup> , Stanford University
163	Celecoxib Nanoparticles for Therapeutic Angiogenesis	Katy Margulis <sup>1,2</sup> , Evgenios Neofytou <sup>3</sup> , Ramin Beygui <sup>3,4</sup> , Richard Zare <sup>1,2</sup> Departments of Chemistry <sup>1</sup> and Cardiothoracic Surgery <sup>2</sup> , Falk Cardiovascular Research Center <sup>3</sup> , Stanford University; Heart & Vascular Center <sup>4</sup> , NorthBay Medical Center, Fairfield
164	Statistical Algorithms for Improved Detection of Circular and Linear Splicing from RNA-Seq	Linda Szabo <sup>1</sup> , Peter Wang <sup>2</sup> , Julia Salzman <sup>2</sup> Departments of Biomedical Informatics <sup>1</sup> and Biochemistry <sup>2</sup> , Stanford University
165	Enhancing Learning and Memory via the Presynaptic Action of PirB Receptor	Maja Djuricic <sup>1</sup> , Mehrdad Shamloo <sup>2</sup> , Carla J. Shatz <sup>1</sup> Departments of Biological Sciences <sup>1</sup> and Neurosurgery <sup>2</sup> , Stanford University
166	New Methods in Quantification to Win the Fight Against Parasitic Disease	Nathaniel I. Strong <sup>1</sup> , Minkyu Kim <sup>2</sup> , Sindy K.Y. Tang <sup>2</sup> , Craig Criddle <sup>1</sup> Departments of Civil & Environmental Engineering <sup>1</sup> and Mechanical Engineering <sup>2</sup> , Stanford University
167	Abnormal Eye Movement Behavior and Reading Left-to-Right after Stroke Due to Homonymous Visual Field Defect	Jaelyn H. Hwang <sup>1</sup> , M. Ali Shariati <sup>1</sup> , Caroline Yu <sup>1</sup> , Y. Joyce Liao <sup>1</sup> Department of Ophthalmology <sup>1</sup> , Stanford University
168	CRISPR/Cas9 Versus RNAi: Identification of Human Essential Genes Using Genome-Wide Screens	David W. Morgens <sup>1</sup> , Richard M. Deans <sup>2</sup> , Amy Li <sup>1</sup> , Michael C. Bassik <sup>1,3</sup> Departments of Genetics <sup>1</sup> and Chemistry <sup>2</sup> and Chemistry, Engineering, & Medicine for Human Health (ChEM-H) <sup>3</sup> , Stanford University;
169	Targeting 24-nt phasiRNA Biogenesis and Function in Maize with CRISPR-Mediated Mutants	Han Zhang <sup>1</sup> , Blake C. Meyers <sup>2,3</sup> , Bing Yang <sup>4</sup> , Virginia Walbot <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University; Department of Plant & Soil Sciences <sup>2</sup> and Delaware Biotechnology Institute <sup>3</sup> , University of Delaware; Department of Genetics, Development & Cell Biology <sup>4</sup> , Iowa State University
170	Brain Stimulation with Focused Ultrasound: The Mechanism of Action	Jan Kubanek <sup>1,2</sup> , Stephen Baccus <sup>2</sup> , Miriam Goodman <sup>2</sup> Departments of Molecular & Cell Physiology <sup>1</sup> and Neurobiology <sup>2</sup> , Stanford University