



# Stanford Bio-X Interdisciplinary Initiatives Seed Grants Symposium

## Poster Session

August 29, 2019

*Posters are alphabetized by the last name of the presenter.*

*Presenters' names are listed in bold.*

### 2019 STANFORD BIO-X UNDERGRADUATE SUMMER RESEARCH PROGRAM COHORT

POSTER #	TITLE	AUTHORS
1	Characterizing Neural Activity in the ALM and Medulla	<b>Nic Becker</b> <sup>1</sup> , Shaul Druckmann <sup>2,3</sup> Departments of Physics <sup>1</sup> , Neurobiology <sup>2</sup> , and Psychiatry & Behavioral Sciences <sup>3</sup> , Stanford University
2	How Are Neurons Assembled? Exploring the Molecular Mechanisms of Nemitin, a Novel Microtubule Organizing Protein	<b>Brandon Bergsneider</b> <sup>1</sup> , Ivan Millan <sup>1</sup> , Yanmin Yang <sup>1</sup> Department of Neurology & Neurological Sciences <sup>1</sup> , Stanford University
3	Connecting Single-Sarcomere Dynamics with Contractile Force Production in DMD hiPSC-CMs	<b>Foster Birnbaum</b> <sup>1</sup> , Gaspard Pardon <sup>1</sup> , Helen Blau <sup>1</sup> Department of Microbiology & Immunology <sup>1</sup> , Stanford University
4	Multiple Overlapping Hypothalamus-Brainstem Circuits Drive Rapid Threat Avoidance	<b>Susanna Bradbury</b> <sup>1,2</sup> , Matthew Lovett-Barron <sup>1,2</sup> , Ritchie Chen <sup>1,2</sup> , Karl Deisseroth <sup>1,2,3,4</sup> Departments of Bioengineering <sup>1</sup> and Psychiatry & Behavioral Sciences <sup>3</sup> , CNC Program <sup>2</sup> , and Howard Hughes Medical Institute <sup>4</sup> , Stanford University
5	Light Up the Labyrinth: Creating Map for Forelimb Motor Neuron Circuits in Immunodeficient Rats	<b>Xiangmeng Cai</b> <sup>1</sup> , Vanessa Doulames <sup>2</sup> , David Altman <sup>2</sup> , Dean Tran <sup>2</sup> , Giles W. Plant <sup>2</sup> Departments of Bioengineering <sup>1</sup> and Neurosurgery <sup>2</sup> , Stanford University
6	Sulfate-Reducing Bacteria and Gut Inflammation in Bangladeshi Children	<b>Rebecca Christensen</b> <sup>1</sup> , Jessica Grembi <sup>2</sup> , Alfred Spormann <sup>2</sup> Departments of Biology <sup>1</sup> and Civil & Environmental Engineering <sup>2</sup> , Stanford University
7	Investigating the Immunological Structure and Composition of Tuberculosis Granulomas with Multiplexed Ion Beam Imaging	<b>Alea Delmastro</b> <sup>1,2</sup> , Erin McCaffrey <sup>3,4</sup> , Joshua Mattila <sup>5</sup> , Noah Greenwald <sup>3</sup> , Leeat Keren <sup>3</sup> , Michael Angelo <sup>3</sup> Departments of Chemical Engineering <sup>1</sup> and Pathology <sup>3</sup> , Stanford Bio-X Undergraduate Summer Research Program <sup>2</sup> , and Immunology Program <sup>4</sup> , Stanford University; Department of Infectious Diseases & Microbiology <sup>5</sup> , University of Pittsburgh
8	Making Mosquitoes the New Grunt Pipettors: Rapid Polling of Vector-Pathogen Ecology	<b>Clayton Ellington</b> <sup>1</sup> , Shailabh Kumar <sup>1</sup> , Felix Hol <sup>1</sup> , Manu Prakash <sup>1</sup> Department of Bioengineering <sup>1</sup> , Stanford University
9	Multiplexed Serum Autoantibody Profiling of Idiopathic Multicentric Castleman Disease (iMCD)	<b>Allan Feng</b> <sup>1</sup> , Tea Dodig-Crnkovic <sup>2</sup> , Sarah Chang <sup>1</sup> , Jochen Schwenk <sup>2</sup> , David Fajgenbaum <sup>3</sup> , Paul J. Utz <sup>1</sup> Department of Medicine <sup>1</sup> , Stanford University; KTH Royal Institute of Technology <sup>2</sup> , Stockholm; Perelman School of Medicine <sup>3</sup> , University of Pennsylvania
10	Suppressing Huntingtin Aggregation Through the Directed Evolution of ApiCCT1	<b>Anthony Flores</b> <sup>1</sup> , T. Kelly Rainbolt <sup>1</sup> , Judith Frydman <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University

11	Crystallization of a Novel Immune Checkpoint Protein	<b>Jessica Frank</b> <sup>1</sup> , Jack Silberstein <sup>1,2</sup> , Daniel Fernandez <sup>3</sup> , Jennifer Cochran <sup>1,2</sup> Department of Bioengineering <sup>1</sup> , Program in Immunology <sup>2</sup> , and ChEM-H Macromolecular Structure Knowledge Center <sup>3</sup> , Stanford University
12	Uncovering the Mechanism of Smoothed Activation in Hedgehog Signaling through Directed Mutagenesis	<b>Sara Frigui</b> <sup>1</sup> , Maia Kinnebrew <sup>1</sup> , Rajat Rohatgi <sup>1</sup> Department of Biochemistry <sup>1</sup> , Stanford University
13	Determining the Effect of Maternal Immune Activation on Priming Microglial Responses	<b>Catherine Gao</b> <sup>1</sup> , Jennifer Su <sup>1</sup> , Theo Palmer <sup>1</sup> Department of Neurosurgery <sup>1</sup> , Stanford University
14	Air Pollution, Cellular Aging, and Stress Biology in Adolescents: The Role of Familial Risk for Depression	<b>Julia S. Gillette</b> <sup>1</sup> , Jonas G. Miller <sup>1</sup> , Ian H. Gotlib <sup>1</sup> Stanford Neurodevelopment, Affect & Psychopathology Laboratory <sup>1</sup> , Stanford University
15	Loss of Adaptive Myelination Contributes to Methotrexate Chemotherapy-Related Cognitive Impairment	<b>Jacob Greene</b> <sup>1,2</sup> , Anna C. Geraghty <sup>1,2</sup> , Erin M. Gibson <sup>1</sup> , Reem A. Ghanem <sup>1</sup> , Alfonso Ocampo <sup>1</sup> , Andrea K. Goldstein <sup>1</sup> , Lijun Ni <sup>1</sup> , Tao Yang <sup>1</sup> , Rebecca M. Marton <sup>2,3</sup> , Sergiu P. Pasca <sup>2,3</sup> , Michael E. Greenberg <sup>4</sup> , Frank M. Longo <sup>1,2</sup> , Michelle Monje <sup>1,3,5,6,7</sup> Departments of Neurology & Neurological Sciences <sup>1</sup> , Psychiatry & Behavioral Sciences <sup>3</sup> , Pathology <sup>5</sup> , and Pediatrics <sup>6</sup> , Stanford Bio-X <sup>2</sup> , and Institute for Stem Cell Biology & Regenerative Medicine <sup>7</sup> , Stanford University; Department of Neurobiology <sup>4</sup> , Harvard Medical School
16	The Nuclear Option: Regulation of the Nuclear Lamina in Tumor Evolution	<b>Sierra Ha</b> <sup>1</sup> , Amar Mirza <sup>1</sup> , Siegen McKellar <sup>1</sup> , Fernanda Gonzalez <sup>1</sup> , Anthony Oro <sup>1</sup> Department of Dermatology (Program in Epithelial Biology) <sup>1</sup> , Stanford University
17	<i>In situ</i> Barcode Sequencing for Pooled CRISPR Screens	<b>Cynthia Hao</b> <sup>1</sup> , Adrian Sanborn <sup>2,3</sup> , Lorenzo Labitigan <sup>4,5</sup> , Julie Theriot <sup>5</sup> , Roger Kornberg <sup>2</sup> Departments of Bioengineering <sup>1</sup> , Structural Biology <sup>2</sup> , Computer Science <sup>3</sup> , and Biochemistry <sup>4</sup> , Stanford University; Department of Biology <sup>5</sup> , University of Washington
18	Engineering Cyanobacteria to Synthesize and Produce Stromal Cell Derived Factor 1-alpha (SDF1 - $\alpha$ )	<b>Maria Paula Hernandez</b> <sup>1</sup> , Kevin James Jaatinen <sup>2,3</sup> , Hanjay Wang <sup>2,3</sup> , Joseph Woo <sup>2,3</sup> Departments of Bioengineering <sup>1</sup> and Cardiothoracic Surgery <sup>2</sup> and Stanford Advanced Therapeutics for Heart Failure Research Laboratory <sup>3</sup> , Stanford University
19	Using Nanopore Long-Read Sequencing to Investigate Cryptic Adaptation	<b>Sam Hoelscher</b> <sup>1</sup> , Gavin Sherlock <sup>1</sup> Department of Genetics <sup>1</sup> , Stanford University
20	Extending LitGen: Incorporating Expert Knowledge for Literature Curation	<b>Emily Huang</b> <sup>1</sup> , Julia Gimbernat <sup>1</sup> , Allen Nie <sup>1</sup> , Carlos Bustamante <sup>1</sup> Department of Biomedical Data Science <sup>1</sup> , Stanford University
21	The Dark Side of the Brain: Defining the Molecular Mechanisms Underlying Neurofibromatosis 1 - Optic Pathway Gliomas	<b>Jared Hysinger</b> <sup>1</sup> , Yuan Pan <sup>2</sup> , Nicki Schindler <sup>3</sup> , James Lennon <sup>2</sup> , Anitha Ponnuswami <sup>2</sup> , Xiaofan Guo <sup>4</sup> , Yu Ma <sup>4</sup> , Courtney Corman <sup>4</sup> , David Gutmann <sup>4</sup> , Michelle Monje <sup>2</sup> Departments of Biology <sup>1</sup> , Neurology <sup>2</sup> , and Human Biology <sup>3</sup> , Stanford University; Department of Neurology <sup>4</sup> , Washington University
22	The I-BAR Gene <i>Mtss1</i> Regulates Endocytosis in Cerebellar Astrocytes	Alexander S. Brown <sup>1</sup> , Jessica Magri <sup>1</sup> , <b>Woo Joo Kwon</b> <sup>1</sup> , Anthony E. Oro <sup>1*</sup>

		(*corresponding author) Program in Epithelial Biology <sup>1</sup> , Stanford University
23	New Genetic Tools Reveal Dynamic Populations of Transitioning Cells During <i>Drosophila</i> Intestinal Homeostasis	<b>Andrew Labott</b> <sup>1</sup> , Erin Sanders <sup>1,2</sup> , Lucy O'Brien <sup>1</sup> Departments of Molecular & Cellular Physiology <sup>1</sup> and Developmental Biology <sup>2</sup> , Stanford University
24	Ciliary INVS Is Oxygen Sensitive Independent of the NEK8-ANKS6 Complex	<b>Tracy Lang</b> <sup>1</sup> , Henrietta Bennett <sup>1</sup> , Timothy Klasson <sup>2</sup> , Peter Jackson <sup>1</sup> Departments of Microbiology & Immunology <sup>1</sup> and Radiation Oncology <sup>2</sup> , Stanford University
25	Dendritic Spine Density in an Alzheimer's Mouse Model	<b>Kate LeBlanc</b> <sup>1</sup> , Michelle Drews <sup>1</sup> , Carla Shatz <sup>1,2</sup> Departments of Biology <sup>1</sup> and Neurobiology <sup>2</sup> , Stanford University
26	A Foundation for Massively Parallel Precise Genome Editing in Human Cells	<b>Jiwoo Lee</b> <sup>1</sup> , Shi-An Chen <sup>1</sup> , Xiaoshu Xu <sup>2</sup> , Stanley Lei Qi <sup>2</sup> , Hunter Fraser <sup>1</sup> Departments of Biology <sup>1</sup> and Bioengineering <sup>2</sup> , Stanford University
27	Adrenaline Rush: Characterizing Noradrenaline Expression in the Prefrontal Cortex	<b>Max Lee</b> <sup>1</sup> , Adrienne Mueller <sup>1</sup> , Tirin Moore <sup>1</sup> Department of Neurobiology <sup>1</sup> , Stanford University
28	Seeing with a Meaning: Functional MRI Mapping of Social Gaze Features under Dynamic Visual Stimuli in the Common Marmoset	<b>Andrew Tong Li</b> <sup>1</sup> , Nicholas Alexander Tran <sup>1</sup> , Nikola Todorov Markov <sup>1</sup> , Keren Haroush <sup>1</sup> Department of Neurobiology <sup>1</sup> , Stanford University
29	Assessing Dimensionality Reduction Techniques Downstream of Coupled Clustering on Single Cell Genomic Data	<b>Miranda Li</b> <sup>1</sup> , Zhana Duren <sup>1</sup> , Wing H. Wong <sup>1</sup> Department of Statistics <sup>1</sup> , Stanford University
30	Developing a Cellular Vaccine for Liver-Stage Malarial Infection	<b>Matthew Liao</b> <sup>1,2</sup> , Rodolfo Vicetti Miguel <sup>1</sup> , Nirk Quispe Calla <sup>1</sup> , Kristen Aceves <sup>1</sup> , Thomas Cherpes <sup>1</sup> Department of Comparative Medicine <sup>1</sup> and Stanford Bio-X <sup>2</sup> , Stanford University
31	Characterizing Cell-Type Dependent IRES Activity of circRNAs Using a High-Throughput Library Screening Method	<b>Fan Liu</b> <sup>1,2</sup> , Chun-Kan Chen <sup>1,2</sup> , Howard Y. Chang <sup>1,2</sup> Departments of Dermatology <sup>1</sup> and Genetics <sup>2</sup> , Stanford University
32	Synthetic Efforts Toward 10-Saxitoxinethanoic Acid	<b>Jay Liu</b> <sup>1,2</sup> , Holly Hajare <sup>1</sup> , Justin Du Bois <sup>1</sup> Departments of Chemistry <sup>1</sup> and Computer Science <sup>2</sup> , Stanford University
33	Applying CRISPR Tools to Engineer Parallel Logic Gates in Mammalian Cells	<b>Kasey Love</b> <sup>1</sup> , Hannah R. Kempton <sup>1</sup> , Laine Goudy <sup>1</sup> , Stanley Lei Qi <sup>1,2,3</sup> Departments of Bioengineering <sup>1</sup> and Chemical & Systems Biology <sup>2</sup> and ChEM-H <sup>3</sup> , Stanford University
34	Combating High Grade Serous Ovarian Cancer: Identifying Drug Combinations to Target and Destroy Carboplatin-Resistant VMH Cells	<b>Alexis Lowber</b> <sup>1,2</sup> , Ying-Wen Huang <sup>1,2</sup> , Jacob Bedia <sup>1,2</sup> , Alyssa Mike <sup>1,2</sup> , Veronica D. Muñoz <sup>3</sup> , Wendy J. Fantl <sup>1,2</sup> Departments of Urology <sup>1</sup> , Obstetrics & Gynecology <sup>2</sup> , and Microbiology & Immunology <sup>3</sup> , Stanford University
35	Identifying Molecular Biomarkers of Acute Respiratory Distress Syndrome (ARDS) Through Desorption Ionization Mass Spectrometry and Machine Learning	<b>Rohan Mehrotra</b> <sup>1</sup> , Zhenpeng Zhou <sup>1,2</sup> , Angela Rogers <sup>3</sup> , Richard N. Zare <sup>1</sup> Departments of Chemistry <sup>1</sup> and Medicine (Pulmonary & Critical Care Division) <sup>3</sup> , Stanford University; Facebook, Inc. <sup>3</sup>
36	A Bioengineered 3D Model of Osteosarcoma Using Gelatin-Based Microribbon Scaffolds	<b>Omeed Miraftab-Salo</b> <sup>1</sup> , Eva C. González Díaz <sup>1</sup> , Fan Yang <sup>1,2</sup> Departments of Bioengineering <sup>1</sup> and Orthopaedic Surgery <sup>2</sup> , Stanford University
37	Elucidating the Role of ARMCX3 in Synaptogenesis	<b>Stephen Moye</b> <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

38	Virus Inclusive Single Cell RNA-Seq Profiling in Cells Infected With Venezuelan Equine Encephalitis Virus	<b>Avery Muniz</b> <sup>1</sup> , Sathish Kumar <sup>2,3</sup> , Zhiyuan Yao <sup>2,3</sup> , Sirle Saul <sup>2,3</sup> , and Shirit Einav <sup>2,3</sup> Departments of Biology <sup>1</sup> , Medicine (Division of Infectious Diseases and Geographic Medicine) <sup>2</sup> , and Microbiology & Immunology <sup>3</sup> , Stanford University
39	c-Jun Amplifies the Pro-Osteogenic Potential of Osteoprogenitors Through Increased Hedgehog- and Wnt-Signaling	<b>Claire Muscat</b> <sup>1</sup> , Tristan Lerbs <sup>1</sup> , Camille van Neste <sup>1</sup> , Pablo Domizi <sup>1</sup> , Yong-Hun Kim <sup>1</sup> , Alexa Vu <sup>1</sup> , Charles K. Chan <sup>2</sup> , Gerlinde Wernig <sup>1,2</sup> Department of Pathology <sup>1</sup> and Institute for Stem Cell Biology & Regenerative Medicine <sup>2</sup> , Stanford University
40	The Functional Role of Amygdala-Dopamine Interactions in Motivated Behaviors	Elizabeth E. Steinberg <sup>1,2</sup> , Felicity Gore <sup>1,2,3,4</sup> , Madison D. Taylor <sup>1,2</sup> , <b>Zane C. Norville</b> <sup>1,2</sup> , Talia N. Lerner <sup>2,3,4,5</sup> , Karl Deisseroth <sup>2,3,4</sup> , Robert C. Malenka <sup>1,2</sup> Departments of Psychiatry & Behavioral Sciences <sup>2</sup> and Bioengineering <sup>4</sup> , Nancy Pritzker Laboratory <sup>1</sup> , and HHMI <sup>3</sup> , Stanford University; Department of Physiology <sup>5</sup> , Northwestern University
41	Profiling the Inflammasome Assembly Time Course after dMCAO Stroke	<b>Sierra Porter</b> <sup>1</sup> , Victoria Hernandez <sup>1</sup> , Marion Buckwalter <sup>1</sup> Department of Neurology & Neurological Sciences <sup>1</sup> , Stanford University
42	Investigating the Effects of Hormone Treatment on Cognition, Behavior, and Neurodevelopment in Transgender Youth	<b>Bobby Radecki</b> <sup>1</sup> , Maureen Gil <sup>1</sup> , Sharon Bade Shrestha <sup>1</sup> , Iliana Karipidis <sup>1</sup> , David Hong <sup>1</sup> Department of Psychiatry & Behavioral Sciences (Center for Interdisciplinary Brain Science Research) <sup>1</sup> , Stanford University
43	Exploring Innate Immune Cell Responses to Dengue Virus	<b>John Rees</b> <sup>1</sup> , Laura Simpson <sup>2</sup> , Catherine Blish <sup>2</sup> Departments of Biology <sup>1</sup> and Medicine (Infectious Diseases) <sup>2</sup> , Stanford University
44	Investigating Cell Composition Differences in Human Cortical Spheroids Derived from 22q11 Deletion Syndrome Patients	<b>Julia M. Schaepe</b> <sup>1,2</sup> , Themasap A. Khan <sup>1,2</sup> , Sergiu P. Pasca <sup>1,2</sup> Department of Psychiatry & Behavioral Sciences <sup>1</sup> and Stanford Human Brain Organogenesis Program <sup>2</sup> , Stanford University
45	Cell-Type Specific Subcellular Organization of Delta and Mu Opioid Receptors	<b>Ethan Schonfeld</b> <sup>1</sup> , William McCallum <sup>2,3,4,5</sup> , Gregory Scherrer <sup>2,3,4,5,6</sup> School of Humanities & Sciences <sup>1</sup> , Departments of Anesthesiology, Perioperative & Pain Medicine <sup>2</sup> , Molecular & Cellular Physiology <sup>3</sup> , and Neurosurgery <sup>4</sup> , Wu Tsai Neurosciences Institute <sup>5</sup> , and New York Stem Cell Foundation – Robertson Investigator <sup>6</sup> , Stanford University
46	The Effect of Baseline Ability and Age on Improvements in a Specialized Skill-Specific Cognitive Training Regimen	<b>Jacob Shaw</b> <sup>1</sup> , Hannah Fingerhut <sup>1</sup> , Lindsay Chromik <sup>1</sup> , S.M. Hadi Hosseini <sup>1</sup> Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University
47	The Role of Ceramide Synthesis in Regulating Myelination in Zebrafish	<b>Tara Shelby</b> <sup>1</sup> , Ellen Bouchard <sup>1</sup> , William Talbot <sup>1</sup> Department of Developmental Biology <sup>1</sup> , Stanford University
48	c-Jun Drives Scleroderma through Increased Hedgehog Signaling	<b>Tyler Shibata</b> <sup>1*</sup> , Tristan Lerbs <sup>1*</sup> , Lu Cui <sup>1</sup> , Tim Chai <sup>2</sup> , Claire Muscat <sup>1</sup> , Gerlinde Wernig <sup>1,2</sup> (*equal contribution) Department of Pathology <sup>1</sup> and Institute for Stem Cell Biology & Regenerative Medicine <sup>2</sup> , Stanford University
49	Making (Peristaltic) Waves: Exploring the Enteric Nervous System Using an <i>ex vivo</i> Gastrointestinal Motility Monitor	<b>Rahul Shiv</b> <sup>1</sup> , Subhamoy Das <sup>1</sup> , Estelle Spear <sup>2</sup> , Grant Hennig <sup>3</sup> , Aida Habtezion <sup>2</sup> , Julia Kaltschmidt <sup>1,4</sup> Departments of Neurosurgery <sup>1</sup> and Gastroenterology <sup>2</sup> and Wu Tsai Neurosciences

		Institute <sup>4</sup> , Stanford University; Department of Pharmacology <sup>3</sup> , University of Vermont
50	Developing an Opioid-Induced Hyperalgesic Rat Model for NF-κB Activation Studies	<b>Anika Sinha</b> <sup>1</sup> , Mikhail Klukinov <sup>1</sup> , Eunjoo Choi <sup>1</sup> , David C. Yeomans <sup>1</sup> Department of Anesthesiology <sup>1</sup> , Stanford University
51	Investigating the Dynamics of HIF-1α Activation in Response to Immune Stimuli	<b>Joanna Song</b> <sup>1</sup> , Stevan Jeknić <sup>1</sup> , Markus W Covert <sup>1</sup> Department of Bioengineering <sup>1</sup> , Stanford University
52	Dissecting the RNA Interactome	<b>Stephen Su</b> <sup>1</sup> , Jason Cheng <sup>1</sup> , Le Cong <sup>1,2</sup> Departments of Genetics <sup>1</sup> and Pathology <sup>2</sup> , Stanford University
53	Genetic and Proteomic Ligand Discovery for CD22, a Microglial Homeostasis Regulator	<b>Jerry Sun</b> <sup>1,2</sup> , John V. Plavinage <sup>1,3,4</sup> , Michael S. Haney <sup>1</sup> , Ryan A. Flynn <sup>5</sup> , Carolyn R. Bertozzi <sup>5,6,7,8</sup> , Tony Wyss-Coray <sup>1,7,9,10,11</sup> Departments of Neurology & Neurological Sciences <sup>1</sup> , Chemical Engineering <sup>2</sup> , Chemistry <sup>5</sup> , and Chemical & Systems Biology <sup>6</sup> , Medical Scientist Training Program <sup>3</sup> , Stem Cell Biology & Regenerative Medicine Graduate Program <sup>4</sup> , ChEM-H <sup>7</sup> , Paul F. Glenn Center for the Biology of Aging <sup>10</sup> , and Wu Tsai Neurosciences Institute <sup>11</sup> , Stanford University; Howard Hughes Medical Institute <sup>8</sup> ; VA Palo Alto Health Care System <sup>9</sup>
54	Developing an Image Recognition Atlas for Optogenetic Functional Ultrasound Imaging of the Brain in Awake and Behaving Mice	<b>Colton Swingle</b> <sup>1</sup> , Brad Edelman <sup>2</sup> , Giovanna Diletta Ielacqua <sup>2</sup> , Jin Hyung Lee <sup>1,2,3,4</sup> Departments of Bioengineering <sup>1</sup> , Neurology & Neurological Sciences <sup>2</sup> , Neurosurgery <sup>3</sup> , and Electrical Engineering <sup>4</sup> , Stanford University
55	<i>In vivo</i> Temporal Mapping of Proneural Transcription Factors <i>Ascl1</i> and <i>Myt1</i> During Embryonic Pulmonary Development	<b>Mingqian Tan</b> <sup>1</sup> , Christin Kuo <sup>1</sup> Department of Pediatrics <sup>1</sup> , Stanford University
56	Exploring Small Eye Movements and Adaptive Plasticity in the Mouse Oculomotor Integrator	<b>Ella Tessier-Lavigne</b> <sup>1</sup> , Sriram Jayabal <sup>1</sup> , Jennifer Raymond <sup>1</sup> Department of Neurobiology <sup>1</sup> , Stanford University
57	The Antenna's All the Difference: How Does Having a Ciliated Centriole Change Centriole Function?	<b>Anais Tsai</b> <sup>1</sup> , Emily Ho <sup>2</sup> , Tim Stearns <sup>1,3</sup> Departments of Biology <sup>1</sup> , Developmental Biology <sup>2</sup> , and Genetics <sup>3</sup> , Stanford University
58	Determining the Mechanisms by Which SGLT2 Inhibitors Improve Vascular Function in Diabetes	<b>Emma Tsai</b> <sup>1,2,3</sup> , Ian Y. Chen <sup>1,4</sup> , Vincent Wo <sup>1,2,3</sup> , Huaxiao Yang <sup>1,2,3</sup> , Pedro Medina <sup>1,4</sup> , Cho-Kai Wu <sup>1,2,3</sup> , Chun Liu <sup>1,2,3</sup> , Nazish Sayed <sup>1,2,3</sup> , Tracy McLaughlin <sup>5</sup> , Joseph Wu <sup>1,2,3</sup> Cardiovascular Institute <sup>1</sup> and Departments of Medicine (Divisions of Cardiovascular Medicine <sup>2</sup> and Endocrinology <sup>3</sup> ) and Radiology <sup>3</sup> , Stanford University; Medical Service (Cardiology Section) <sup>4</sup> , VA Palo Alto Health Care System
59	Genetic Mechanisms of Olfactory Receptor Specification During Development in <i>Drosophila</i>	<b>David Vacek</b> <sup>1</sup> , Hongjie Li <sup>1</sup> , Liqun Luo <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
60	Epigenetic Modulation of CAR T Cell Function	<b>Panayiotis Vandris</b> <sup>1</sup> , Evan W. Weber <sup>1</sup> , Crystal L. Mackall <sup>1</sup> Stanford Cancer Institute <sup>1</sup> , Stanford University
61	Maximum-Flow Formulation Identifies High-Confidence Variants in Simple Repeat Sequences Associated with Autism Spectrum Disorder	<b>Maya Varma</b> <sup>1</sup> , Kelley Paskov <sup>2</sup> , Brianna Chrisman <sup>3</sup> , Min Woo Sun <sup>2,5</sup> , Jae-Yoon Jung <sup>2,5</sup> , Nate Stockham <sup>4</sup> , Peter Washington <sup>3</sup> , Dennis P. Wall <sup>2,5</sup> Departments of Computer Science <sup>1</sup> , Biomedical Data Science <sup>2</sup> , Bioengineering <sup>3</sup> , Neuroscience <sup>4</sup> , and Pediatrics <sup>5</sup> , Stanford University

62	Visualization and Manipulation of Novel Hypothalamic Sexually Dimorphic Genes	<b>Grace Wang</b> <sup>1,2</sup> , Joe Knodler <sup>1</sup> , Nirao Shah <sup>1,2</sup> Departments of Psychiatry & Behavioral Sciences <sup>1</sup> and Neurobiology <sup>2</sup> , Stanford University
63	Finding Markers of Human Stress Responses through Virtual Reality Using Objective Physiological Measurements	<b>Marlon Joseph Washington II</b> <sup>1</sup> , Melis Yilmaz Balban <sup>1</sup> , Andrew Huberman <sup>2</sup> Departments of Neurobiology <sup>1</sup> and Ophthalmology <sup>2</sup> , Stanford University
64	Demographic Inference from Smartphone Gait Acceleometry: Applying Deep Convolutional Networks to the MyHeartCounts Six-Minute Walk Test	<b>Daniel Wu</b> <sup>1</sup> , Anna Shcherbina <sup>2</sup> , Steve Hershman <sup>2</sup> , Euan Ashley <sup>2</sup> Departments of Computer Science <sup>1</sup> and Medicine <sup>2</sup> , Stanford University
65	An Enzymatic Toolkit for Studying Mucin-Domain Glycoproteins	<b>Emily Yang</b> <sup>1,2</sup> , Judy Shon <sup>2</sup> , Stacy A. Malaker <sup>2</sup> , Carolyn R. Bertozzi <sup>2,3</sup> Departments of Biology <sup>1</sup> and Chemistry <sup>2</sup> , Stanford University; Howard Hughes Medical Institute <sup>3</sup>



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## Poster Session

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Posters are alphabetized by the last name of the presenter.

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### STANFORD BIO-X GRADUATE STUDENTS, POSTDOCS, FACULTY, AND RESEARCHERS

POSTER #	TITLE	AUTHORS
66	Full Optogenetic Control of Human Cardiomyocytes and Engineered Heart Muscle	<b>Oscar J. Abilez</b> <sup>1,2,3,4</sup> , Yan Zhuge <sup>2</sup> , Bhagat Patlolla <sup>2,6</sup> , Charu Ramakrishnan <sup>7,9</sup> , Joshua Baugh <sup>1</sup> , Elina Tzatzalos <sup>2</sup> , Paul Chang <sup>6</sup> , Huaxiao Yang <sup>2</sup> , Kitchener D. Wilson <sup>2</sup> , Ramin E. Beygui <sup>1,2,6</sup> , Christopher K. Zarins <sup>1,2,5</sup> , Ellen Kuhl <sup>1,2,6,10</sup> , Karl Deisseroth <sup>1,7,8,9</sup> , Joseph C. Wu <sup>1,2,3,4,8</sup> Stanford Bio-X <sup>1</sup> , Stanford Cardiovascular Institute <sup>2</sup> , Institute for Stem Cell Biology & Regenerative Medicine <sup>8</sup> , and Departments of Medicine <sup>3</sup> , Cardiovascular Medicine <sup>4</sup> , Surgery <sup>5</sup> , Cardiothoracic Surgery <sup>6</sup> , Psychiatry & Behavioral Sciences <sup>7</sup> , Bioengineering <sup>9</sup> , and Mechanical Engineering <sup>10</sup> , Stanford University
67	High-Throughput Cultivation of Stable, Diverse, Fecal-Derived Microbial Communities to Model the Intestinal Microbiota	<b>Andrés Aranda-Díaz</b> <sup>1</sup> , Katharine Ng <sup>1</sup> , Tani Thomsen <sup>1</sup> , Imperio Real Ramírez <sup>1</sup> , Dylan Dahan <sup>2</sup> , Susannah Dittmar <sup>1</sup> , Taylor Chavez <sup>1</sup> , Feiqiao Brian Yu <sup>3</sup> , Norma Neff <sup>3</sup> , Justin Sonnenburg <sup>2,3</sup> , Kerwyn Casey Huang <sup>2,3</sup> Departments of Bioengineering <sup>1</sup> and Microbiology & Immunology <sup>2</sup> , Stanford University; Chan Zuckerberg Biohub <sup>3</sup>
68	Phase Behavior in Polyelectrolyte Complex Coacervates Mediated by Local Polarity and Polymer Composition	Junzhe Lou <sup>1,2</sup> , <b>Kayla Barker</b> <sup>1</sup> , Sean Friedowitz <sup>2</sup> , Karis Will <sup>1</sup> , Jian Qin <sup>3</sup> , Yan Xia <sup>1</sup> Departments of Chemistry <sup>1</sup> , Materials Science & Engineering <sup>2</sup> , and Chemical Engineering <sup>3</sup> , Stanford University
69	Semi-Automated Assessment of Mitochondrial Function and Oxidative Stress in Primary Neuronal Cultures	<b>Anvee Bhutani</b> <sup>1</sup> , <b>Anees Mohideen</b> <sup>1</sup> , Brian Griffiths <sup>1</sup> , Xiaoyun Sun <sup>1</sup> , Creed Stary <sup>1</sup> Department of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> , Stanford University
70	Dynamic Versus Static Stretching as a Pre-Workout Injury Prevention Strategy	<b>Nick Bianco</b> <sup>1</sup> , Mary Hall <sup>1</sup> , Emily Tucci <sup>1</sup> , Scott Delp <sup>1,2,3</sup> Departments of Mechanical Engineering <sup>1</sup> , Bioengineering <sup>2</sup> , and Orthopaedic Surgery <sup>3</sup> , Stanford University
71	Microfluidic Guillotine Reveals Multiple Mechanisms and Time Scales of Single-Cell Wound Repair	<b>Lucas R. Blanch</b> <sup>1</sup> , <b>Kevin Zhang</b> <sup>1</sup> , Seth Cordts <sup>1</sup> , Wallace Marshall <sup>2</sup> , Sindy K. Y. Tang <sup>1</sup> Department of Mechanical Engineering <sup>1</sup> , Stanford University; Department of Biochemistry & Biophysics <sup>2</sup> , University of California—San Francisco
72	Biodegradation of Plastic Waste by Mealworms: Preventing Pollution and Recovering Resources	<b>Anja Malawi Brandon</b> <sup>1</sup> , Wei-Min Wu <sup>1</sup> , Craig S. Criddle <sup>1</sup> Department of Civil & Environmental Engineering <sup>1</sup> , Stanford University
73	<i>Salmonella</i> Typhi Utilizes an RNA Thermosensor to Regulate Virulence Factors and Evade Innate Immune Responses	<b>Susan Brewer</b> <sup>1</sup> , Jens Kortmann <sup>2</sup> , Christian Twittenhoff <sup>3</sup> , Sky Brubaker <sup>1</sup> , Franz Narberhaus <sup>3</sup> , Denise Monack <sup>1</sup>

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74	No printing needed - emailed - confirmed **submitted by Jennifer Brophy 7/10 at 7:08 PM - brophy@stanford.edu Engineering Plant Root Structure Using Synthetic Developmental Regulation	<b>Jennifer A. N. Brophy</b> <sup>1,2</sup> , Katie M. Magallon <sup>1,2</sup> , José R. Dinneny <sup>1,2</sup> Department of Biology <sup>1</sup> , Stanford University; Department of Plant Biology <sup>2</sup> , Carnegie Institution for Science
75	Microfluidic Platform for Quantifying Food Allergy Severity	<b>Nicolas Castaño</b> <sup>1</sup> , <b>Seth Cordts</b> <sup>1</sup> , Fengjiao Lyu <sup>1</sup> , Bryan Bunning <sup>2</sup> , Kari Nadeau <sup>2</sup> , Sindy Tang <sup>1</sup> Departments of Mechanical Engineering <sup>1</sup> and Allergy & Immunology <sup>2</sup> , Stanford University
76	MicroRNA-494 Regulates Fibroproliferative Transformation of Muller Glial Cells	Georgia Kaidonis <sup>1,2</sup> , <b>Heather Chang</b> <sup>2</sup> , <b>Prisha Davda</b> <sup>2</sup> , Xiaoyun Sun <sup>2</sup> , Theodore Leng <sup>1</sup> , Creed Stry <sup>2</sup> Departments of Ophthalmology <sup>1</sup> and Anesthesiology, Perioperative & Pain Medicine <sup>2</sup> , Stanford University
77	Identification of MicroRNA-494 as a Potential Therapeutic Target for Epiretinal Membrane Formation	Georgia Kaidonis <sup>1,2</sup> , <b>Prisha Davda</b> <sup>2</sup> , <b>Heather Chang</b> <sup>2</sup> , Xiaoyun Sun <sup>2</sup> , Theodore Leng <sup>1</sup> , Creed Stry <sup>2</sup> Departments of Ophthalmology <sup>1</sup> and Anesthesiology, Perioperative & Pain Medicine <sup>2</sup> , Stanford University
78	Functional Genetic Variants Revealed by Massively Parallel Precise Genome Editing	Eilon Sharon <sup>1</sup> , <b>Shi-An A. Chen</b> <sup>1</sup> , Neil M. Khosla <sup>1</sup> , Hunter B. Fraser <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
79	Isoflurane, Unlike Propofol, Increases Reactive Aldehyde Metabolism in Both Wild Type Mitochondrial Aldehyde Dehydrogenase 2 (ALDH2) and ALDH2*2 Rodents	<b>Monika Chowaniec</b> <sup>1</sup> , Didi Goodnough <sup>1</sup> , Adriana Gardner <sup>1</sup> , Pritam Sinharoy <sup>1</sup> , Eric Gross <sup>1</sup> Department of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> , Stanford University
80	Ionic and Non-Ionic Clinical Contrast Agents and Their Effects on the Swelling Behavior of Sheep Meniscus Fibrocartilage	<b>Hollis A. Crowder</b> <sup>1</sup> , Christina Martin <sup>1</sup> , E. Gaby Baylon <sup>2</sup> , Marc Levenston <sup>1,3</sup> Departments of Mechanical Engineering <sup>1</sup> and Radiology <sup>3</sup> , Stanford University; Department of Orthopaedic Surgery <sup>2</sup> , University of California–San Francisco
81	Defining the Contribution of T Cells to the Pathogenesis of Coronary Atherosclerosis	<b>Jessica D'Addabbo</b> <sup>1</sup> , Roshni Chowdhury <sup>2</sup> , Xianxi Huang <sup>1</sup> , Houyin Zhang <sup>1</sup> , David Louis <sup>2</sup> , Stefan Veizades <sup>2</sup> , Su Yu <sup>1</sup> , Jack Boyd <sup>3</sup> , Joseph Woo <sup>3</sup> , Charles Chan <sup>4</sup> , Yueh-hsiu Chien <sup>2</sup> , Mark Davis <sup>2</sup> , Patricia Nguyen <sup>1,2,5</sup> Stanford Cardiovascular Institute <sup>1</sup> , Institute for Immunity, Transplantation & Infection <sup>2</sup> , and Departments of Cardiothoracic Surgery <sup>3</sup> , Surgery (Division of Plastic Surgery) <sup>4</sup> , and Medicine (Division of Cardiovascular Medicine) <sup>5</sup> , Stanford University
82	OpenSim Moco: Musculoskeletal Optimal Control	<b>Christopher L. Dembia</b> <sup>1</sup> , Nicholas A. Bianco <sup>1</sup> , Antoine Falisse <sup>2</sup> , Jennifer L. Hicks <sup>2</sup> , Scott L. Delp <sup>1,3</sup> Departments of Mechanical Engineering <sup>1</sup> and Bioengineering <sup>3</sup> , Stanford University; Department of Movement Sciences <sup>2</sup> , KU Leuven, Belgium
83	MicroRNA Controls over Corticospinal Motor Neuron Development	<b>Jessica L. Diaz</b> <sup>1†</sup> , Verl B. Siththanandan <sup>1†</sup> , Victoria Lu <sup>1†</sup> , Jessica L. MacDonald <sup>7</sup> , Nicole Gonzalez-Nava <sup>1,2</sup> , Lincoln Pasquina <sup>4,5,6</sup> , Peter Sarnow <sup>3</sup> , Theo Palmer <sup>1</sup> , Jeffrey D. Macklis <sup>4,5,6*</sup> , Suzanne A. Tharin <sup>1*</sup> (†co-first authors; *equal contribution and corresponding authors) Departments of Neurosurgery <sup>3</sup> and Microbiology & Immunology <sup>3</sup> , Stanford University; Department of Biostatistics & Bioinformatics <sup>2</sup> , Duke



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84	Simulation of Contrast Agent Dynamics in Digital Brain Phantom for CT Perfusion Optimization	<b>Sarah E. Divel</b> <sup>1,2</sup> , Søren Christensen <sup>3</sup> , Maarten G. Lansberg <sup>3,4</sup> , Norbert J. Pelc <sup>2,5</sup> Departments of Electrical Engineering <sup>1</sup> , Radiology <sup>2</sup> , Neurology & Neurological Sciences <sup>4</sup> , and Bioengineering <sup>5</sup> and Stanford Stroke Center <sup>3</sup> , Stanford University
85	Pulmonary Artery Hemodynamic Changes in Pediatric Patients with Ventricular Septal Defects	<b>Melody Dong</b> <sup>1</sup> , Weiguang Yang <sup>2</sup> , Marlene Rabinovitch <sup>2</sup> , Jeffrey Feinstein <sup>1,2</sup> , Alison Marsden <sup>1,2</sup> Departments of Bioengineering <sup>1</sup> and Pediatric Cardiology <sup>2</sup> , Stanford University
86	Exploiting Saxitoxin Coumarin Photocages for Voltage-Gated Sodium Channel Control	<b>Anna Elleman</b> <sup>1</sup> , Christopher Makinson <sup>2</sup> , Alli Haynes <sup>1</sup> , John Huguenard <sup>2</sup> , Justin DuBois <sup>1</sup> Departments of Chemistry <sup>1</sup> and Neurology & Neurological Sciences <sup>2</sup> , Stanford University
87	Vulnerable Locations on the Head to Brain Injury and Implications For Helmet Design	<b>Michael Fanton</b> <sup>1</sup> , Jake Sganga <sup>2</sup> , David Camarillo <sup>1,2</sup> Departments of Mechanical Engineering <sup>1</sup> and Bioengineering <sup>2</sup> , Stanford University
88	It's Not Just Fun and Games: A Qualitative Review of the Most Utilized Virtual Reality Games in Pediatric Healthcare	Vincent Sferra <sup>1</sup> , <b>Ahtziri Fonseca</b> <sup>2</sup> , Ellen Wang <sup>2</sup> , Michael Khoury <sup>2</sup> , Nicole Neiman <sup>2</sup> , Maria Menendez <sup>2</sup> Department of Microbiology & Immunology <sup>1</sup> , Miami University; Department of Anesthesiology, Perioperative, & Pain Medicine <sup>2</sup> , Lucile Packard Children's Hospital, Stanford University
89	Detection of Stress Hormone in Sweat for Wearable Application	<b>Amir M. Foudeh</b> <sup>1</sup> , Vittorio Mottini <sup>1</sup> , Yasser Khan <sup>1</sup> , Emilie Peres <sup>1</sup> , Kelly Liu <sup>1</sup> , Zhenan Bao <sup>1</sup> Department of Chemical Engineering <sup>1</sup> , Stanford University
90	Spatial Statistics for Violence Prevention – Understanding Patterns of Violence in Nairobi through GPS Data	<b>Rina Friedberg</b> <sup>1</sup> , Clea Sarnquist <sup>2</sup> , Gavin Nyairo <sup>3</sup> , Mary Amuyunzu-Nyamongo <sup>3</sup> , Mike Baiocchi <sup>1,4</sup> Departments of Statistics <sup>1</sup> and Pediatrics <sup>2</sup> and Prevention Research Center <sup>4</sup> , Stanford University; African Institute for Health and Development <sup>3</sup>
91	Engineering Polymer Conformation for Efficient Carbon Nanotube Sorting	<b>Theodore Z. Gao</b> <sup>1</sup> , Zehao Sun <sup>2,3</sup> , Xuzhou Yan <sup>2,4</sup> , Zhenan Bao <sup>2</sup> Departments of Materials Science & Engineering <sup>1</sup> and Chemical Engineering <sup>2</sup> , Stanford University; College of Chemistry & Molecular Engineering <sup>3</sup> , Peking University; Department of Polymer Science & Engineering <sup>4</sup> , Shanghai Jiao Tong University
92	Using Toxins to Explore Allosteric Regulation of Voltage-Gated Sodium Channels	<b>Catherine E. Garrison</b> <sup>1</sup> , Robert A. Craig II <sup>1</sup> , Tim M. MacKenzie <sup>1</sup> , Justin Du Bois <sup>1</sup> Department of Chemistry <sup>1</sup> , Stanford University
93	Investigating Spinal-Enteric Neural Circuitry in the Mouse Colon	<b>Julieta Gomez-Frittelli</b> <sup>1</sup> , Stephan Rogalla <sup>2,3</sup> , Julia A. Kaltschmidt <sup>4</sup> Departments of Chemical Engineering <sup>1</sup> , Radiology <sup>2</sup> , and Neurosurgery <sup>4</sup> and Molecular Imaging Program at Stanford (MIPS) <sup>3</sup> , Stanford University
94	Phenotypic Ranking of Circulating Tumor Cells Using Magnetic Levitation Ranking Cytometry	<b>Colin Grant</b> <sup>1,2</sup> , Gozde Durmus <sup>3,4</sup> Canary Center at Stanford for Cancer Early Detection <sup>1</sup> , Canary CREST Program <sup>2</sup> , Department of Radiology <sup>3</sup> , and Molecular Imaging Program at Stanford (MIPS) <sup>4</sup> , Stanford University

95	Single Cell Radiometry Using Droplet Optofluidics	<b>Byunghang Ha</b> <sup>1</sup> , Tae Jin Kim <sup>2</sup> , Ejung Moon <sup>2</sup> , Guillem Pratz <sup>2</sup> Departments of Mechanical Engineering <sup>1</sup> and Radiation Oncology <sup>2</sup> , Stanford University
96	Whole Brain Seizure Networks at Single Cell Resolution	<b>Darian H. Hadjiabadi</b> <sup>1,2</sup> , Matthew Lovett-Barron <sup>1</sup> , Ivan Raikov <sup>2</sup> , Scott. C. Baraban <sup>4</sup> , Jure Leskovec <sup>3</sup> , Karl Deisseroth <sup>1</sup> , Ivan Soltesz <sup>2</sup> Departments of Bioengineering <sup>1</sup> , Neurosurgery <sup>2</sup> , and Computer Science <sup>3</sup> , Stanford University; Department of Neurological Surgery <sup>4</sup> , University of California—San Francisco
97	The Murine Transcriptome in 17 Tissues: Uncovering Global Ageing Nodes with Organ-Specific Phase and Amplitude	<b>Oliver Hahn</b> <sup>1,3*</sup> , Nicholas Schaum <sup>1,3*</sup> , Benoit Lehallier <sup>1*</sup> , Patricia Losada <sup>1</sup> , Andreas Keller <sup>4</sup> , <i>Tabula Muris</i> Consortium <sup>5</sup> , Stephen Quake <sup>2,5,8</sup> , Tony Wyss-Coray <sup>1,3,6,7,8</sup> (*co-first authors) Departments of Neurology & Neurological Sciences <sup>1</sup> and Bioengineering <sup>2</sup> , Paul F. Glenn Center for the Biology of Aging <sup>6</sup> , Stanford ChEM-H <sup>7</sup> , and Stanford Bio-X <sup>8</sup> , Stanford University; Center for Tissue Regeneration, Repair, & Restoration <sup>3</sup> , VA Palo Alto Health Care System; Center for Bioinformatics <sup>4</sup> , Saarland University; Chan Zuckerberg Biohub <sup>5</sup>
98	Development of Saxitoxin-Based, Subtype-Selective Tools for Studying Voltage-Gated Sodium Channels	<b>Holly S. Hajare</b> <sup>1</sup> , Doris T. Y. Tang <sup>1</sup> , Rhiannon Thomas-Tran <sup>1</sup> , Jay M. Liu <sup>1</sup> , Justin Du Bois <sup>1</sup> Department of Chemistry <sup>1</sup> , Stanford University
99	Engineering a Rodent TRPV1 Receptor with Qualities of the Chicken Modulate Calcium Influx and Mitochondrial Function	<b>Shufang He</b> <sup>1</sup> , Vanessa O. Zambelli <sup>1</sup> , Pritam Sinharoy <sup>1</sup> , Yang Bian <sup>1</sup> , Eric R. Gross <sup>1</sup> Department of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> , Stanford University
100	“I Like to Move It, Move It” - Design Considerations for Implementing and Calibrating a Mobile Virtual Physical Therapy Platform	<b>Sydney Hemphill</b> <sup>1</sup> , Alan Nguyen <sup>1</sup> , Samuel Rodriguez <sup>1</sup> , Thomas J. Caruso <sup>1</sup> Department of Anesthesiology, Perioperative, & Pain Medicine <sup>1</sup> , Lucile Packard Children’s Hospital, Stanford University
101	No Pain, Just Game: Physical Therapy with Virtual Reality in the Inpatient and Outpatient Setting - A Case Series	Alan Nguyen <sup>1</sup> , <b>Sydney Hemphill</b> <sup>1</sup> , Samuel Rodriguez <sup>1</sup> , <b>Maria Menendez</b> <sup>1</sup> , Thomas J. Caruso <sup>1</sup> Department of Anesthesiology, Perioperative, & Pain Medicine <sup>1</sup> , Lucile Packard Children’s Hospital, Stanford University
102	Structural Basis of Glucose-6-Phosphate Dehydrogenase Deficiency	<b>Naoki Horikoshi</b> <sup>1,2,3</sup> , Sunhee Hwang <sup>4</sup> , Fatemeh Jabbarpour <sup>2,3</sup> , Andrew G. Raub <sup>4</sup> , Cornelius Gati <sup>2,3</sup> , Tsutomu Matsui <sup>5</sup> , Adriana A. Garcia <sup>4</sup> , Josh Broweleit <sup>3</sup> , Xinyu Xiang <sup>3</sup> , Andrew Chiang <sup>3</sup> , Rachel Broweleit <sup>3</sup> , Daria Mochly-Rosen <sup>4</sup> , Soichi Wakatsuki <sup>2,3</sup> Life Science Center for Survival Dynamics <sup>1</sup> , University of Tsukuba; BioSciences Division <sup>2</sup> and Stanford Synchrotron Radiation Lightsource <sup>5</sup> , SLAC National Accelerator Laboratory; Departments of Structural Biology <sup>3</sup> and Chemical & Systems Biology <sup>4</sup> , Stanford University
103	TextureNet: Consistent Local Parametrizations for Learning from High-Resolution Signals on Meshes	<b>Jingwei Huang</b> <sup>1</sup> , Haotian Zhang <sup>1</sup> , Li Yi <sup>1</sup> , Thomas Funkhouser <sup>2</sup> , Matthias Niessner <sup>3</sup> , Leonidas Guibas <sup>1</sup> Department of Computer Science <sup>1</sup> , Stanford University; Department of Computer Science <sup>2</sup> , Princeton University; Department of Computer Science <sup>3</sup> , Technical University of Munich

104	High-Throughput Measurements of Red Blood Cell Deformation in Microfluidic Channels	<b>Diego A. Huyke</b> <sup>1</sup> , Diego I. Oyarzun <sup>1</sup> , Amir Saadat <sup>2</sup> , Paulina V. Escobar <sup>3</sup> , Ingrid H. Øvreeide <sup>4</sup> , Eric S.G. Shaqfeh <sup>2</sup> , Juan G. Santiago <sup>1</sup> Departments of Mechanical Engineering <sup>1</sup> and Chemical Engineering <sup>2</sup> , Stanford University; Department of Mechanical Engineering <sup>3</sup> , Pontificia Universidad Católica de Chile; Department of Physics <sup>4</sup> , Norwegian University of Science & Technology
105	Enabling Safe and Real-Time Ultrasound Molecular Imaging for Early Cancer Detection Using Beamforming Neural Networks	<b>Dongwoon Hyun</b> <sup>1</sup> , Rakesh Bam <sup>1</sup> , Leandra L. Brickson <sup>2</sup> , Lotfi Abou-Elkacem <sup>3</sup> , Ramasamy Paulmurugan <sup>1</sup> , Jeremy J. Dahl <sup>1</sup> Departments of Radiology <sup>2</sup> and Bioengineering <sup>2</sup> , Stanford University; MD Anderson Cancer Center <sup>3</sup>
106	Heuristic-Based Exoskeleton Control for Co-Adaptive Locomotor Assistance	<b>Rachel W. Jackson</b> <sup>1,2</sup> , Scott L. Delp <sup>2,3,4</sup> , Steven H. Collins <sup>1,3</sup> Department of Mechanical Engineering <sup>1</sup> , Carnegie Mellon University; Departments of Bioengineering <sup>2</sup> , Mechanical Engineering <sup>3</sup> , and Orthopaedic Surgery <sup>4</sup> , Stanford University
107	Ketamine Produces a Long-Lasting Enhancement of Synaptic Transmission	<b>Grace Jang</b> <sup>1</sup> , M. Bruce MacIver <sup>1</sup> Department of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> , Stanford University
108	Cardiometabolic Disease Progression Studies in UK Biobank	<b>Johanne Marie Justesen</b> <sup>1,2</sup> , Yosuke Tanigawa <sup>1</sup> , Robert Tibshirani <sup>1,3</sup> , Trevor Hastie <sup>1,3</sup> , Manuel Rivas <sup>1</sup> Departments of Biomedical Data Science <sup>1</sup> , Cardiovascular Medicine <sup>2</sup> , and Statistics <sup>3</sup> , Stanford University
109	A Structured Tumor-Immune Microenvironment in Triple Negative Breast Cancer Revealed by Multiplexed Imaging	<b>Leeat Keren</b> <sup>1</sup> , Marc Bosse <sup>1</sup> , Allison Kurian <sup>1</sup> , David Van Valen <sup>2,3</sup> , Robert West <sup>1</sup> , Sean C. Bendall <sup>1</sup> , Michael Angelo <sup>1</sup> Department of Pathology <sup>1</sup> , Stanford University; Departments of Biology <sup>2</sup> and Bioengineering <sup>3</sup> , Caltech
110	Positron Emission Microscopy in Cancer Precision Medicine	<b>Syamantak Khan</b> <sup>1</sup> , JuneHo Shin <sup>2</sup> , Ning Cheng <sup>3</sup> , Calvin Kuo <sup>3</sup> , John B. Sunwoo <sup>2</sup> , Guillem Praxt <sup>1</sup> Departments of Radiation Oncology <sup>1</sup> , Otolaryngology <sup>2</sup> , and Medicine (Division of Hematology) <sup>3</sup> , Stanford University
111	Pebbles the Penguin™ “Nose” Best: The Use of Virtual Reality to Promote Cooperation and Reduce Anxiety During Pediatric ENT Procedures - A Randomized Controlled Trial	<b>Michael Khoury</b> <sup>1</sup> , Madison Kist <sup>1</sup> , Martine Madill <sup>1</sup> , Katherine Taylor <sup>1</sup> , Ahtziri Fonseca <sup>1</sup> , Maria Menendez <sup>1</sup> , Douglas Sidell <sup>2</sup> , Kara D. Meister <sup>2</sup> , Ellen Wang <sup>1</sup> , Samuel Rodriguez <sup>1</sup> , Thomas J. Caruso <sup>1</sup> Departments of Anesthesiology, Perioperative, & Pain Medicine <sup>1</sup> and Otolaryngology - Head & Neck Surgery <sup>2</sup> , Lucile Packard Children’s Hospital, Stanford University
112	Augmented Reality as a Tool to Reduce Fear and Promote Cooperation During Pediatric Nasal Endoscopy	Martine Madill <sup>1</sup> , <b>Michael Khoury</b> <sup>1</sup> , Thomas J. Caruso <sup>1</sup> , Douglas Sidell <sup>2</sup> , Kara D. Meister <sup>2</sup> , Ellen Wang <sup>1</sup> , Maria Menendez <sup>1</sup> , Samuel Rodriguez <sup>1</sup> Departments of Anesthesiology, Perioperative, & Pain Medicine <sup>1</sup> and Otolaryngology - Head & Neck Surgery <sup>2</sup> , Lucile Packard Children’s Hospital, Stanford University
113	Interaction with Ubiquitous Robots through Abstract Motion and Touch	<b>Lawrence H. Kim</b> <sup>1</sup> , Sean Follmer <sup>1</sup> Department of Mechanical Engineering <sup>1</sup> , Stanford University
114	Uncovering the Fitness-Relevant Phenotypes of Microbes Adapting to Novel Environments	<b>Grant Kinsler</b> <sup>1*</sup> , Kerry Geiler-Samerotte <sup>2*</sup> , Dmitri Petrov <sup>1</sup>

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115	Myelination of Individual Mouse Neocortical Parvalbumin Interneurons	<b>Marianna Kiraly</b> <sup>1</sup> , <b>Kristina Micheva</b> <sup>1</sup> , Mark Perez <sup>1</sup> , Daniel Madison <sup>1</sup> Department of Molecular & Cellular Physiology <sup>1</sup> , Stanford University
116	“Cast Off” Pain and Anxiety with Technology-Based Distractions during Minor Surgical Procedures in Pediatric Outpatient Orthopedic Clinic	<b>Madison Kist</b> <sup>1</sup> , Nicole Neiman <sup>1</sup> , Hal Rives <sup>1</sup> , Katherine Hastings <sup>2</sup> , Maria Menendez <sup>1</sup> , Ellen Wang <sup>1</sup> , Samuel Rodriguez <sup>1</sup> , Thomas J. Caruso <sup>1</sup> Departments of Anesthesiology, Perioperative, & Pain Medicine <sup>1</sup> and Orthopaedic Surgery <sup>2</sup> , Lucile Packard Children’s Hospital, Stanford University
117	Validating a Novel Scale for Assessing Patient Anxiety, Behavior, and Cooperation During Mask Induction of Anesthesia and IV Placement	<b>Madison Kist</b> <sup>1</sup> , Michael Khoury <sup>1</sup> , Maria Menendez <sup>1</sup> , Ellen Wang <sup>1</sup> , Samuel Rodriguez <sup>1</sup> , Thomas J. Caruso <sup>1</sup> Department of Anesthesiology, Perioperative, & Pain Medicine <sup>1</sup> , Lucile Packard Children’s Hospital, Stanford University
118	A Mixed-Reality Application for Visualizing Patient Anatomy and Planning Thoracic Surgery	<b>Brooke Krajancich</b> <sup>1</sup> , Stephanie L. Perkins <sup>2,3</sup> , Brian A. Hargreaves <sup>1,3</sup> , Bruce L. Daniel <sup>1,2</sup> , Chi-Fu Jeffrey Yang <sup>4</sup> , Mark F. Berry <sup>4</sup> Departments of Electrical Engineering <sup>1</sup> , Bioengineering <sup>2</sup> , Radiology <sup>3</sup> , and Cardiothoracic Surgery <sup>4</sup> , Stanford University
119	Imaging Brain Function with Simultaneous BOLD and Viscoelasticity Contrast: fMRI/fMRE	<b>Patricia S. Lan</b> <sup>1</sup> , Kevin J. Glaser <sup>2</sup> , Richard L. Ehman <sup>2</sup> , Gary H. Glover <sup>3</sup> Departments of Bioengineering <sup>1</sup> and Radiology <sup>3</sup> , Stanford University; Department of Radiology <sup>2</sup> , Mayo Clinic
120	Subcellular Omics Approach to Study Lysosomal Function in Health and Disease	<b>Nouf Laqtom</b> <sup>1,2</sup> , <b>Monther Abu-Remaileh</b> <sup>1,2,3</sup> Departments of Chemical Engineering <sup>1</sup> and Genetics <sup>3</sup> and Institute of Chemistry, Engineering & Medicine for Human Health (ChEM-H) <sup>2</sup> , Stanford University
121	Lights, Camera, Action: Virtual Reality Versus Live Simulation for Medical Education	Katherine Taylor <sup>1</sup> , <b>Kiley Lawrence</b> <sup>1</sup> , Martine Madill <sup>1</sup> , Sydney Hemphill <sup>1</sup> , Emma Armstrong-Carter <sup>1</sup> , Maria Menendez <sup>1</sup> , Asheen Rama <sup>1</sup> , Ellen Wang <sup>1</sup> , Samuel Rodriguez <sup>1</sup> , Thomas J. Caruso <sup>1</sup> Department of Anesthesiology, Perioperative, & Pain Medicine <sup>1</sup> , Lucile Packard Children’s Hospital, Stanford University
122	Uncharacterized Protein MAB21L4 Is Required for Epidermal Differentiation and Suppression of Cancer Invasion	Cristina Tommasi <sup>1</sup> , Dane Sessions <sup>1</sup> , Angela Mah <sup>1</sup> , Jasmine Garcia <sup>1</sup> , Michael Lee <sup>1</sup> , Brittany Stinson <sup>1</sup> , Tomas Bencomo <sup>1</sup> , Kenneth Tsai <sup>3,4</sup> , Vanessa Lopez-Pajares <sup>1</sup> , <b>Carolyn Lee</b> <sup>1,2</sup> Department of Dermatology <sup>1</sup> and VA Palo Alto Health Care System <sup>2</sup> , Stanford University; Departments of Anatomic Pathology <sup>3</sup> and Tumor Biology <sup>4</sup> , H. Lee Moffitt Cancer Center & Research Institute
123	Building the Fly Olfactory System: Insights From Single Cell Analysis	<b>Hongjie Li</b> <sup>1,2</sup> , Felix Horns <sup>3,4</sup> , Tongchao Li <sup>1,2</sup> , Jiefu Li <sup>1,2</sup> , Qijing Xie <sup>1,2</sup> , Chuanyun Xu <sup>1,2</sup> , Bing Wu <sup>1,2</sup> , Justus M. Kepschull <sup>1,2</sup> , David Vacek <sup>1,2</sup> , Anthony Xie <sup>1,2</sup> , David J. Luginbuhl <sup>1,2</sup> , Stephen R. Quake <sup>3,4,5</sup> , Liqun Luo <sup>1,2</sup> Departments of Biology <sup>1</sup> , Bioengineering <sup>3</sup> , and Applied Physics <sup>4</sup> and Howard Hughes Medical Institute <sup>2</sup> , Stanford University; Chan Zuckerberg Biohub <sup>5</sup>
124	Octopi: Open, Configurable High-Throughput Imaging Platform for Diagnostics and Research	<b>Hongquan Li</b> <sup>1</sup> , Lucas Fuentes Valenzuela <sup>1</sup> , Maxime Voisin <sup>2</sup> , Hazel Soto-Montoya <sup>3</sup> , Ethan Li <sup>3</sup> , Manu Prakash <sup>3</sup>

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125	Cell-Surface Proteomic Landscape of Developing and Mature Olfactory Neurons	<b>Jiefu Li</b> <sup>1,2</sup> , Shuo Han <sup>1,3,4</sup> , Hongjie Li <sup>1,2</sup> , Namrata D. Udeshi <sup>8</sup> , Tanya Svinkina <sup>8</sup> , D. R. Mani <sup>8</sup> , Chuanyun Xu <sup>1,2</sup> , Ricardo Guajardo <sup>1,2</sup> , Qijing Xie <sup>1,2</sup> , Tongchao Li <sup>1,2</sup> , Bing Wu <sup>1,2</sup> , Anthony Xie <sup>1,2</sup> , David J. Luginbuhl <sup>1,2</sup> , Pornchai Kaewsapsak <sup>1,3,4</sup> , Stephen R. Quake <sup>5,6,7</sup> , Steven A. Carr <sup>8</sup> , Alice Y. Ting <sup>1,3,4</sup> , Liqun Luo <sup>1,2</sup> Departments of Biology <sup>1</sup> , Genetics <sup>3</sup> , Chemistry <sup>4</sup> , Bioengineering <sup>5</sup> and Applied Physics <sup>6</sup> , Howard Hughes Medical Institute <sup>2</sup> , and Chan Zuckerberg Biohub <sup>7</sup> , Stanford University; The Broad Institute of MIT and Harvard <sup>8</sup>
126	Single Nucleotide Mapping of the Locally Accessible Trait Space in Yeast Reveals Pareto Fronts that Constrain Initial Adaptation	<b>Yuping Li</b> <sup>1</sup> , Dmitri A. Petrov <sup>1*</sup> , Gavin Sherlock <sup>2*</sup> (*equal contribution) Departments of Biology <sup>1</sup> and Genetics <sup>2</sup> , Stanford University
127	3D-Bioprinted Lattices for Efficient Expansion of Neural Progenitor Cells	<b>Christopher D. Lindsay</b> <sup>1</sup> , Julien G. Roth <sup>2</sup> , Bauer L. LeSavage <sup>3</sup> , Sarah C. Heilshorn <sup>1</sup> Departments of Materials Science & Engineering <sup>1</sup> and Bioengineering <sup>3</sup> and Institute for Stem Cell Biology & Regenerative Medicine <sup>2</sup> , Stanford University
128	Attention and Working Memory in Mental Illness: Experimental Design and Preliminary Results	<b>Ruth Ling</b> <sup>1**</sup> , Arielle S. Keller <sup>1*</sup> , Bailey Holt-Gosselin <sup>1</sup> , Leanne M. Williams <sup>1</sup> (*equal contribution) Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University
129	Dynamics of Developmental Strategies That Drive Cell Identity and Plasticity	<b>Camila Lopez-Anido</b> <sup>1</sup> , Dominique Bergmann <sup>1,2</sup> Department of Biology <sup>1</sup> and HHMI <sup>2</sup> , Stanford University
130	Engineering and Understanding Dynamic Hyaluronan Hydrogels for 3D Cell Culture and Cell Delivery	<b>Junzhe Lou</b> <sup>1,2</sup> , Christopher Lindsay <sup>1</sup> , Sean Friedowitz <sup>1</sup> , Jian Qin <sup>3</sup> , Sarah Heilshorn <sup>1</sup> , Yan Xia <sup>2</sup> Departments of Materials Science & Engineering <sup>1</sup> , Chemistry <sup>2</sup> , and Chemical Engineering <sup>3</sup> , Stanford University
131	Dosimetry Challenges in FLASH Radiotherapy of Small Animal	<b>Rakesh Manjappa</b> <sup>1</sup> , Jinghui Wang <sup>1</sup> , Karen Levy <sup>2</sup> , Lawrie Skinner <sup>1</sup> , Emil Schueler <sup>1</sup> , Edward Graves <sup>1</sup> , Karl Bush <sup>1</sup> , Shu-Jung Yu <sup>1</sup> , Erinn B. Rankin <sup>2</sup> , Peter G. Maxim <sup>3</sup> , Billy W. Loo Jr. <sup>1</sup> Departments of Radiation Oncology <sup>1</sup> and Gynecologic Oncology <sup>2</sup> , Stanford University; Department of Radiation Oncology <sup>3</sup> , Indiana University
132	3D Printed Radiation Shield for Mouse Irradiation Studies Using Clinical Linac Accelerators	Jinghui Wang <sup>1</sup> , <b>Rakesh Manjappa</b> <sup>1</sup> , Karen Levy <sup>2</sup> , Lawrie Skinner <sup>1</sup> , Emil Schueler <sup>1</sup> , Edward Graves <sup>1</sup> , Karl Bush <sup>1</sup> , Shu-Jung Yu <sup>1</sup> , Erinn B. Rankin <sup>2</sup> , Peter G. Maxim <sup>3</sup> , Billy W. Loo Jr. <sup>1</sup> Departments of Radiation Oncology <sup>1</sup> and Gynecologic Oncology <sup>2</sup> , Stanford University; Department of Radiation Oncology <sup>3</sup> , Indiana University
133	Clog-Free Sorting Using Hydrodynamic Obstacles	Endre J. Mossige <sup>1</sup> , <b>Arnold J.T.M. Mathijssen</b> <sup>2</sup> , Michaela Hinks <sup>2</sup> , Sasha Zemsky <sup>2</sup> , Zachary Sexton <sup>2</sup> , Prima Sinawang <sup>2</sup> , Ana Uriarte <sup>2</sup> , Chunzi Liu <sup>1</sup> , Polly Fordyce <sup>2</sup> Departments of Chemical Engineering <sup>1</sup> and Bioengineering <sup>2</sup> , Stanford University
134	Membrane and Fluid Contactors for Safe and Efficient Methane Delivery in Methanotrophic Bioreactors	<b>Jorge Luis Meraz</b> <sup>1</sup> , Kristian L. Dubrawski <sup>1</sup> , Sahar H. El Abbadi <sup>1</sup> , Kwang Ho-Choo <sup>2</sup> , Craig Criddle <sup>1</sup>

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135	A Data-Compressive Wired-OR Readout for Massively Parallel Neural Recording	<b>Dante Muratore</b> <sup>1,2</sup> , Pulkit Tandon <sup>1</sup> , Mary Wootters <sup>2,3</sup> , E. J. Chichilnisky <sup>4,5,6</sup> , Subhasish Mitra <sup>1,3</sup> , Boris Murmann <sup>1</sup> Departments of Electrical Engineering <sup>1</sup> , Computer Science <sup>3</sup> , Neurosurgery <sup>4</sup> , and Ophthalmology <sup>5</sup> , Wu Tsai Neurosciences Institute <sup>2</sup> , and Hansen Experimental Physics Laboratory <sup>6</sup> , Stanford University
136	Neural Predictors of Cognitive Training Outcomes in Mild Cognitive Impairment: Pilot Study	<b>Shayan Nazarifar</b> <sup>1,2</sup> , Jacob Shaw <sup>1</sup> , Elveda Gozdas <sup>1</sup> , Hannah Fingerhut <sup>1</sup> , Hadi Hosseini <sup>1</sup> Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University; Program in Biology <sup>2</sup> , University of California—Davis
137	Trust Your Gut with Virtual Reality Mindfulness	<b>Nicole Neiman</b> <sup>1</sup> , Martine Madill <sup>1</sup> , Katherine Taylor <sup>1</sup> , Hal Rives <sup>1</sup> , Maria Menendez <sup>1</sup> , Ellen Wang <sup>1</sup> , Samuel Rodriguez <sup>1</sup> , Thomas J. Caruso <sup>1</sup> , Anava Wren <sup>2</sup> Department of Anesthesiology, Perioperative, & Pain Medicine <sup>1</sup> and Pediatrics (Division of Gastroenterology, Hepatology & Nutrition) <sup>2</sup> , Lucile Packard Children’s Hospital, Stanford University
138	Simon Says Freeze: Quantifying Virtual Reality Pain Modulation in Healthy Volunteers through Ice Immersion	Hal Rives <sup>1</sup> , Alan Nguyen <sup>1</sup> , <b>Nicole Neiman</b> <sup>1</sup> , Kiley Lawrence <sup>1</sup> , Katherine Taylor <sup>1</sup> , Ellen Wang <sup>1</sup> , Samuel Rodriguez <sup>1</sup> , Thomas J. Caruso <sup>1</sup> Department of Anesthesiology, Perioperative, & Pain Medicine <sup>1</sup> , Lucile Packard Children’s Hospital, Stanford University
139	Is DWI Equal to PET in the Evaluation of Langerhans Cell Histiocytosis?	<b>Ramyashree Nyalakonda</b> <sup>1</sup> , Anne M. Muehe <sup>1</sup> , Florian Siedek <sup>1</sup> , Ashok J. Theruvath <sup>1</sup> , Michael Jeng <sup>2</sup> , Heike E. Daldrup-Link <sup>1</sup> Departments of Radiology <sup>1</sup> and Pediatrics <sup>2</sup> , Stanford University
140	PEGASuS: PEG Assembled Surface Sensor for Breast Cancer Exosome Detection	<b>Mehmet Giray Ogut</b> <sup>1,2,3</sup> , Mehmet O. Ozen <sup>1,2,3</sup> , Abel Bermudez <sup>2,3</sup> , Fernando J. García Marqués <sup>2,3</sup> , Mark A. Lifson <sup>1,2,3</sup> , Sharon Pitteri <sup>2,3</sup> , Utkan Demirci <sup>1,2,3</sup> Bio-Acoustic MEMS in Medicine (BAMM) Laboratory <sup>1</sup> , Canary Center at Stanford for Cancer Early Detection <sup>2</sup> , and Department of Radiology <sup>3</sup> , Stanford University
141	Preictal Estimation via Intracranial Electrophysiology in People with Refractory Epilepsy	<b>Tomiko Oskotsky</b> <sup>1,2</sup> , Lisa Yamada <sup>3</sup> , Jaimie Henderson <sup>2,4,5,6</sup> , Gerald Grant <sup>2,4,5,6,7,8</sup> , Kevin Graber <sup>4</sup> , Brenda Porter <sup>4,5,6,7</sup> , Paul Nuyujukian <sup>1,2,3,5,6,9</sup> Departments of Bioengineering <sup>1</sup> , Neurosurgery <sup>2</sup> , Electrical Engineering <sup>3</sup> , and Neurology & Neurological Sciences <sup>4</sup> , Wu Tsai Neurosciences Institute <sup>5</sup> , Stanford Bio-X <sup>6</sup> , Child Health Research Institute <sup>7</sup> , Stanford Cancer Institute <sup>8</sup> , and Neurosciences Program <sup>9</sup> , Stanford University
142	Single-Cell Profiling of Human Neurons with Neurofibrillary Tangles in Alzheimer’s Disease	<b>Marcos Otero-Garcia</b> <sup>1</sup> , Yue-Qiang Xue <sup>1</sup> , Tamara Shakouri <sup>2</sup> , Yongning Deng <sup>2,3</sup> , Sam Morabito <sup>4,5</sup> , Riki Kawaguchi <sup>6,7</sup> , Vivek Swarup <sup>5,8</sup> , Inma Cobos <sup>1</sup> Department of Pathology <sup>1</sup> , Stanford University; Departments of Pathology <sup>2</sup> and Psychiatry <sup>6</sup> and Semel Institute for Neuroscience & Human Behavior <sup>7</sup> , University of California—Los Angeles; Department of Neurology <sup>3</sup> , The First

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143	Linking Nerve Stimuli to Perception through Mechanoreceptors in Human Skin	<b>Joseph Pace<sup>1</sup>, Omar Safty<sup>1</sup>, Christopher Berkey<sup>1</sup></b> , Ross Bennett-Kennett <sup>1</sup> , Reinhold H. Dauskardt <sup>1</sup> Department of Materials Science & Engineering <sup>1</sup> , Stanford University
144	Overcoming the Aged Niche to Improve Skeletal Muscle Regeneration	<b>Adelaida R. Palla<sup>1</sup></b> , Andrew T.V. Ho <sup>1</sup> , Glenn Markov <sup>1</sup> , Nora Yucel <sup>1</sup> , Colin A. Holbrook <sup>1</sup> , Ann V. Yang <sup>1</sup> , Peggy Kraft <sup>1</sup> , Helen M. Blau <sup>1</sup> Baxter Laboratory for Stem Cell Biology, Department of Microbiology & Immunology <sup>1</sup> , Stanford University
145	Pathway and Network Embedding Methods for Prioritizing Psychiatric Drugs	<b>Yash Pershad<sup>1</sup></b> , Margaret Guo <sup>2</sup> , Russ B. Altman <sup>3,4</sup> Departments of Bioengineering <sup>1</sup> , Genetics <sup>3</sup> , and Medicine <sup>4</sup> and Biomedical Informatics Program <sup>2</sup> , Stanford University
146	FFPE-CODEX Enables Multiparameter Tissue Imaging of Clinical Cohorts	<b>Darci Phillips<sup>1</sup></b> , Christian Schuerch <sup>1</sup> , Graham Barlow <sup>1</sup> , Salil Bhate <sup>1</sup> , Yury Goltsev <sup>1</sup> , Garry Nolan <sup>1</sup> Department of Microbiology & Immunology <sup>1</sup> , Stanford University
147	Modeling Attention Impairments in Major Depression Disorder	<b>Helen Qiu<sup>1*</sup>, Jason Li<sup>1*</sup></b> , Arielle S. Keller <sup>1</sup> , Leanne M. Williams <sup>1</sup> (*equal contribution) Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University
148	Interfacea: Open-Source Library for Protein Interface Analysis	<b>João Rodrigues<sup>1</sup></b> , Michael Levitt <sup>1</sup> Department of Structural Biology <sup>1</sup> , Stanford University
149	Propensity Score Methods for Merging Observational and Experimental Data	<b>Evan Rosenman<sup>1</sup></b> , Art Owen <sup>1</sup> , Michael Baiocchi <sup>2</sup> Department of Statistics <sup>1</sup> and Prevention Research Center <sup>2</sup> , Stanford University
150	Real-Time Kinetics of Notch-Mediated Fate Decisions During Organ Renewal	<b>Erin N. Sanders<sup>1,2</sup></b> , Judy Martin <sup>1</sup> , Andrew Labott <sup>1</sup> , Lucy Erin O'Brien <sup>1</sup> Departments of Molecular & Cellular Physiology <sup>1</sup> and Developmental Biology <sup>2</sup> , Stanford University
151	Computational Modeling of the Biochemical and Biomechanical Degeneration in Alzheimer's Disease	<b>A. Schäfer<sup>1</sup></b> , Johannes Weickenmeier <sup>2</sup> , Ellen Kuhl <sup>1</sup> Department of Mechanical Engineering <sup>1</sup> , Stanford University
152	Electrocatalytic Sulfur Oxidation in Anaerobic Wastewater Effluents	<b>Xiaohan Shao<sup>1</sup></b> , Sebastien Tilmans <sup>2</sup> , Craig Criddle <sup>1</sup> , William Tarpeh <sup>1,3</sup> Departments of Civil & Environmental Engineering <sup>1</sup> and Chemical Engineering <sup>3</sup> and Codiga Resource Recovery Center <sup>2</sup> , Stanford University
153	Impaired Immune Health in Survivors of Diffuse Large B-Cell Lymphoma	<b>Tanaya Shree<sup>1</sup></b> , Qian Li <sup>2</sup> , Sally L. Glaser <sup>3</sup> , Ann Brunson <sup>2</sup> , Holden T. Maecker <sup>4</sup> , Robert W. Haile <sup>5</sup> , Theresa H.M. Keegan <sup>2</sup> , Ronald Levy <sup>1</sup> Departments of Medicine <sup>1</sup> and Microbiology & Immunology <sup>4</sup> , Stanford University; Center for Oncology Hematology Outcomes Research and Training (COHORT) and Division of Hematology & Oncology <sup>2</sup> , University of California–Davis; Cancer Prevention Institute of California <sup>3</sup> ; Center for Translational Population Sciences <sup>5</sup> , Cedars-Sinai Medical Center
154	Label-Free Imaging of Retinal Cells in the Living Mouse	<b>Nripun Sredar<sup>1</sup></b> , Liang Li <sup>1</sup> , Samuel Steven <sup>1,2</sup> , Yang Hu <sup>1</sup> , Alfredo Dubra <sup>1</sup>

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155	Cryo-EM Reveals Novel Structural Insights of the <i>Tetrahymena</i> Ribozyme	<b>Zhaoming Su</b> <sup>1</sup> , Kalli Kappel <sup>2</sup> , Rhiju Das <sup>2</sup> , Wah Chiu <sup>1,3,4</sup> Departments of Bioengineering <sup>1</sup> , Biochemistry <sup>2</sup> , and Microbiology & Immunology <sup>3</sup> and SLAC National Accelerator Laboratory <sup>4</sup> , Stanford University
156	Supervised Fitting of Geometric Primitives to 3D Point Clouds	Lingxiao Li <sup>1*</sup> , <b>Minhyuk Sung</b> <sup>2*</sup> , Anastasia Dubrovina <sup>2</sup> , Li Yi <sup>3</sup> , Leonidas Guibas <sup>2</sup> (*equal contribution) Departments of Mathematics <sup>1</sup> , Computer Science <sup>2</sup> , and Electrical Engineering <sup>3</sup> , Stanford University
157	“Neglected Moms” – From Childhood Emotional Neglect to Adjustment to Motherhood	<b>Anat Talmon</b> <sup>1</sup> Department of Psychology <sup>1</sup> , Stanford University
158	Ultrasound Parameter Optimization for Microbubble- Mediated Drug Delivery	<b>Arsenii Telichko</b> <sup>1</sup> , Huaijun Wang <sup>1</sup> , Sunitha Bachawal <sup>1</sup> , Rajendran Bose <sup>1</sup> , Ramasamy Paulmurugan <sup>1</sup> , Jeremy Dahl <sup>1</sup> Department of Radiology <sup>1</sup> , Stanford University
159	Automated Classification of Knee X-Rays Using Deep Neural Networks Outperforms Radiologist	<b>Kevin A. Thomas</b> <sup>1</sup> , Lukasz Kidzinski <sup>2</sup> , Eni Halilaj <sup>3</sup> , Scott L. Fleming <sup>1</sup> , Guhan R. Venkataraman <sup>1</sup> , Garry E. Gold <sup>4</sup> , Scott L. Delp <sup>2</sup> Departments of Biomedical Data Science <sup>1</sup> , Bioengineering <sup>2</sup> and Radiology <sup>4</sup> , Stanford University; Department of Mechanical Engineering <sup>3</sup> , Carnegie Mellon University
160	Investigating Viscoelasticity in a Beating Heart	<b>Oguz Ziya Tikenogullari</b> <sup>1</sup> , Vijay Vedula <sup>2</sup> , Francisco Sahli Costabal <sup>1</sup> , Alison Marsden <sup>2,3</sup> , Ellen Kuhl <sup>1</sup> Departments of Mechanical Engineering <sup>1</sup> , Pediatrics <sup>2</sup> , and Bioengineering <sup>3</sup> , Stanford University
161	Gait Retraining as a Treatment for Medial Knee Osteoarthritis	<b>Scott D. Uhlrich</b> <sup>1,5</sup> , Valentina Mazzoli <sup>4</sup> , Julie A. Kolesar <sup>2,5</sup> , Elka Rubin <sup>4</sup> , Amy B. Silder <sup>2,5</sup> , Madeleine Z. Berkson <sup>5</sup> , Andrea Finlay <sup>6</sup> , Feliks Kogan <sup>4</sup> , Garry E. Gold <sup>4</sup> , Gary S. Beaupre <sup>2,5</sup> , Scott L. Delp <sup>1,2,3</sup> Departments of Mechanical Engineering <sup>1</sup> , Bioengineering <sup>2</sup> , Orthopaedic Surgery <sup>3</sup> , and Radiology <sup>4</sup> , Stanford University; Musculoskeletal Research Laboratory <sup>5</sup> and Center for Innovation & Implementation <sup>6</sup> , VA Palo Alto Healthcare System
162	Neocortex-Cerebellum Neural Dynamics During Novel Skill Acquisition	<b>Mark J. Wagner</b> <sup>1</sup> , Tony Hyun Kim <sup>1</sup> , Jonathan Kadmon <sup>1</sup> , Nghia D. Nguyen <sup>1</sup> , Surya Ganguli <sup>1</sup> , Mark J. Schnitzer <sup>1</sup> , Liqun Luo <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
163	Viscoelasticity of the Axon Limits Stretch-Mediated Growth	<b>Lucy Wang</b> <sup>1</sup> , Ellen Kuhl <sup>1,2</sup> Departments of Mechanical Engineering <sup>1</sup> and Bioengineering <sup>2</sup> , Stanford University
164	Sodium Fluoride PET-MRI Detects Regions of Abnormal Bone Response to Acute Exercise	<b>Lauren Watkins</b> <sup>1</sup> , Bryan Haddock <sup>2</sup> , Scott Ulrich <sup>3</sup> , Valentina Mazzoli <sup>4</sup> , Garry Gold <sup>1,4</sup> , Feliks Kogan <sup>4</sup> Departments of Bioengineering <sup>1</sup> , Mechanical Engineering <sup>3</sup> , and Radiology <sup>4</sup> , Stanford University; Department of Clinical Physiology, Nuclear Medicine & PET <sup>2</sup> , Copenhagen University Hospital
165	The Physiologic Characterization of Alcohol Flushing in Human Volunteers	<b>Joe R. White</b> <sup>1</sup> , Kevin N. Zhou <sup>1</sup> , Leslie McNeil <sup>1</sup> , Che-Hong Chen <sup>2</sup> , Daria Mochly- Rosen <sup>2</sup> , Eric R. Gross <sup>1</sup>



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166	Radiation Plus Theranostic Combination Therapy for Targeting Glioblastomas	<b>Wei Wu</b> <sup>1,2,†</sup> , Jessica L. Klockow <sup>1,2,†</sup> , Suchismita Mohanty <sup>1,2</sup> , Kimberly S. Ku <sup>1,2</sup> , Maryam Aghighi <sup>1,2</sup> , Stavros Melemenidis <sup>3</sup> , Zixin Chen <sup>1,2</sup> , Kai Li <sup>1,2</sup> , Goreti Ribeiro Morais <sup>4</sup> , Ning Zhao <sup>1,2</sup> , Jürgen Schlegel <sup>5</sup> , Edward E. Graves <sup>1,2,3</sup> , Jianghong Rao <sup>1,2</sup> , Paul M. Loadman <sup>4</sup> , Robert A. Falconer <sup>4</sup> , Frederick T. Chin <sup>1,2</sup> , Heike E. Daldrup-Link <sup>1,2,*</sup> (†co-first authors; *corresponding author) Departments of Radiology <sup>1</sup> and Radiation Oncology <sup>3</sup> and Molecular Imaging Program at Stanford (MIPS) <sup>2</sup> , Stanford University; Institute of Cancer Therapeutics (Faculty of Life Sciences) <sup>4</sup> , University of Bradford; Department of Neuropathology <sup>5</sup> , Technical University of Munich
167	Biodegradation of Plastic Wastes and Microplastics in the Larvae of Darkling Beetles ( <i>Tenebrio</i> Genus)	<b>Wei-Min Wu</b> <sup>1</sup> , Ronghua Yu <sup>1</sup> , Mayuri Namasivayam <sup>1</sup> , Hazal Kirimli <sup>1</sup> , Anja Malawi Drevitch Brandon <sup>1</sup> , Craig S. Criddle <sup>1</sup> Department of Civil & Environmental Engineering <sup>1</sup> , Stanford University
168	Building a Single-Cell Co-Transcriptomic Atlas of the <i>Toxoplasma</i> Interactome	<b>Yuan (Soso) Xue</b> <sup>1</sup> , Terence Theisen <sup>2</sup> , Suchi Rastogi <sup>2</sup> , Abel Ferrel <sup>2</sup> , John Boothroyd <sup>2</sup> , Stephen Quake <sup>1,3,4</sup> Departments of Bioengineering <sup>1</sup> , Microbiology & Immunology <sup>2</sup> , and Applied Physics <sup>3</sup> and Chan Zuckerberg Biohub <sup>4</sup> , Stanford University
169	Polymer-Nanoparticle Hydrogels as Injectable Antibody Depots	<b>Anthony C. Yu</b> <sup>1</sup> , Gillie Agmon <sup>2</sup> , Awua M. Buahin <sup>1</sup> , Eric A. Appel <sup>1</sup> Departments of Materials Science & Engineering <sup>1</sup> and Bioengineering <sup>2</sup> , Stanford University
170	E-Cigarette Aerosol Elevates Cardiovascular Oxidative Stress in ALDH2*2 Variant Mice	<b>Xuan Yu</b> <sup>1</sup> , Xiaocong Zeng <sup>1</sup> , Ri Chen <sup>1</sup> , Pritam Sinharoy <sup>1</sup> , Eric R. Gross <sup>1</sup> Department of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> , Stanford University
171	Mitochondrial Aldehyde Dehydrogenase-2 Modulates Opioid-Induced Tolerance	<b>Vanessa O. Zambelli</b> <sup>1</sup> , Vivianne L. Tawfik <sup>1</sup> , Eric R. Gross <sup>1</sup> Department of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> , Stanford University
172	CryoEM Demonstrates that ATP Binding to mmCpn Is Statistically Random	<b>Yanyan Zhao</b> <sup>1</sup> , Wah Chiu <sup>2,3,4</sup> Biophysics Program <sup>1</sup> , Departments of Bioengineering <sup>2</sup> and Microbiology & Immunology <sup>3</sup> , and SLAC National Accelerator Laboratory <sup>4</sup> , Stanford University