



# Stanford Bio-X Interdisciplinary Initiatives Seed Grants Poster Session

## September 1, 2023

*Posters are alphabetized by the last name of the presenter.  
Presenters' names are listed in bold.*

POSTER #	TITLE	AUTHORS
1	CryoET Methods to Structurally Characterize SARS-CoV2 VLP Model Systems	<b>Juliana Abramovich</b> <sup>1</sup> , Jesus Galaz-Montoya <sup>2</sup> , Rebekah C. Gullberg <sup>1</sup> , Alexandra Garcia-Godos <sup>1</sup> , Gong-Her Wu <sup>2</sup> , Wah Chiu <sup>2</sup> , Judith Frydman <sup>1</sup> Departments of Biology <sup>1</sup> and Bioengineering <sup>2</sup> , Stanford University
2	Developmental Changes in the Serial Position Function for Different Visual Elements	<b>Grace Adebogun</b> <sup>1,2</sup> , Kelly Wentzlof <sup>2</sup> , Jason D. Yeatman <sup>1,2</sup> , Mahalakshmi Ramamurthy <sup>1,2</sup> Division of Developmental-Behavioral Pediatrics <sup>1</sup> and Graduate School of Education <sup>2</sup> , Stanford University
3	Characterizing Salmonella Intracellular Infection in Human Macrophages	<b>Bryant Alexandre</b> <sup>1,2,4</sup> , George Walters-Marrah <sup>2,3,4</sup> , Monther Abu-Remaileh <sup>2,4,5</sup> Stanford Bio-X Undergraduate Summer Research Program <sup>1</sup> , Sarafan ChEM-H <sup>2</sup> , Biophysics Program <sup>3</sup> , and Departments of Chemical Engineering <sup>4</sup> and Genetics <sup>5</sup> , Stanford University
4	CRISPR-Cas9 Knock-In Approach to Tag Ribosomes	<b>Christina Andronesco</b> <sup>1</sup> , Ching Pin Cheng <sup>1</sup> , Naomi Genuth <sup>1</sup> , Maria Barna <sup>1</sup> Department of Genetics <sup>1</sup> , Stanford University
5	Intracellular Life Cycle of SARS-Cov-2 Genomic RNA Revealed by Super-Resolution Microscopy	<b>Leonid Andronov</b> <sup>1</sup> , Mengting Han <sup>2</sup> , Yanyu Zhu <sup>2</sup> , Andrew E. S. Barentine <sup>1</sup> , Anish R. Roy <sup>1</sup> , Leiping Zeng <sup>2</sup> , Lei S. Qi <sup>2</sup> , W. E. Moerner <sup>1</sup> Departments of Chemistry <sup>1</sup> and Bioengineering <sup>2</sup> , Stanford University
6	Alteration of Skeletal Muscle Innervation with Aging: A Comparison Between Mice and Humans	<b>Ari Arias</b> <sup>1</sup> , Elena Monti <sup>1</sup> , Helen Blau <sup>1</sup> Department of Microbiology & Immunology <sup>1</sup> , Stanford University
7	Developing A Protease-Dependent Axon Degeneration Reporter	<b>Marc Arslanian</b> <sup>1</sup> , Xiaochen Xiong <sup>1</sup> , Marc Tessier-Lavigne <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
8	Dancing Mesenchymal Stem Cells Enhance 3D Chondrogenesis via Early-Stage Cytoskeletal and Nuclear Mechanosensing	<b>Manish Ayushman</b> <sup>1</sup> , Xinming Tong <sup>2</sup> , Pam Cai <sup>3</sup> , Ashby Morrison <sup>4</sup> , Andrew Spakowitz <sup>3</sup> , Sarah Heilshorn <sup>5</sup> , Fan Yang <sup>1,2</sup> Departments of Bioengineering <sup>1</sup> , Orthopaedic Surgery <sup>2</sup> , Chemical Engineering <sup>3</sup> , Biology <sup>4</sup> , and Materials Science & Engineering <sup>5</sup> , Stanford University
9	Robust Adaptive Immune Responses to the mRNA SARS CoV-2 Requires Multiple Antigen Exposures in Children with Inflammatory Bowel Disease	<b>Jessica Balbin</b> <sup>1</sup> , Tracy Tran <sup>2</sup> , Rachel Bensen <sup>2</sup> , Sruti Nadimpalli <sup>2</sup> , Sharon F Chen <sup>2</sup> , Michael Rosen <sup>2</sup> , Dorsey Bass <sup>2</sup> , Alka Goyal <sup>2</sup> , Hayley A. Gans <sup>2</sup> Departments of Chemistry <sup>1</sup> and Pediatrics <sup>2</sup> , Stanford University
10	Healing with Hydrogels and Heat: A Thermosensitive Approach to Corneal Endothelial Cell Delivery	<b>Chris Basco</b> <sup>1</sup> , Euisun Song <sup>2</sup> , David Myung <sup>2</sup> Departments of Biology <sup>1</sup> and Ophthalmology <sup>2</sup> , Stanford University
11	Visual Word ForMore Than Just Words?	<b>Loran Baxter Mercado</b> <sup>1</sup> , Jamie Mitchell <sup>1,2</sup> , Maya Yablonski <sup>3</sup> , Hannah Stone <sup>2</sup> , Jasmine Tran <sup>2</sup> , Mia Fuentes <sup>2</sup> , Jason Yeatman <sup>1,2,3</sup> Department of Psychology <sup>1</sup> , Graduate School of Education <sup>2</sup> , and Developmental-Behavioral Pediatrics <sup>3</sup> , Stanford University
12	Using Fluorescent G-Protein-Coupled Receptor Activation-Based (GRAB) Biosensors to Measure Neuromodulator Release in the Extended Amygdala in Response to Emotionally Salient Stimuli	<b>Max E. Benabou</b> <sup>1</sup> , Yihe Ma <sup>1</sup> , Emmalyn P. Leonard <sup>1</sup> , William J. Giardino <sup>1</sup> Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University

13	Investigating the Role of a Receptor-Related Protein in Neuronal Tau Propagation	<b>Samuel Benabou</b> <sup>1</sup> , Wei Wang <sup>1</sup> , Yanmin Yang <sup>1</sup> Department of Neurology & Neurological Sciences <sup>1</sup> , Stanford University
14	Facilitating Islet Transplantation using Umbilical Cord Mesenchymal Stem Cell Derived Extracellular Vesicles	<b>Alvaro Bermudez-Canete</b> <sup>1</sup> , Rosita Primavera <sup>1</sup> , Shobha Regmi <sup>1</sup> , Fantahun B. Degeneh <sup>1</sup> , Avnesh S. Thakor <sup>1</sup> Interventional Radiology Innovation at Stanford (IRIS), Department of Radiology <sup>1</sup> , Stanford University
15	Arterial and Venous Response to Fluid Shear Stress	<b>Dhruv Bhatt</b> <sup>1</sup> , Jamie Bozeman <sup>2</sup> , Emily Trimm <sup>4</sup> , Kristy Red-Horse <sup>1,3</sup> Department of Biology <sup>1</sup> , Stanford Cardiovascular Institute <sup>2</sup> , and School of Medicine <sup>4</sup> , Stanford University; Howard Hughes Medical Institute <sup>3</sup>
16	ATF6 Reduces Neovascularization and Improves Vision in the Oxygen-Induced Retinopathy Mouse Model	<b>Allyssa Bradley</b> <sup>1,2,3</sup> , Soyeon Park <sup>1,2,3</sup> , Hyejung Min <sup>1,2,3</sup> , Kyle Kim <sup>1,3</sup> , Monica Sophia Diaz-Aguilar <sup>1,2,3,4</sup> , Eun-Jin Lee <sup>1,2,3</sup> , Jonathan H. Lin <sup>1,2,3</sup> Departments of Ophthalmology <sup>1</sup> and Pathology <sup>3</sup> , Stanford University; VA Palo Alto Healthcare System <sup>2</sup> ; Rush University Medical College <sup>4</sup>
17	Cilia-Driven Active Folding in an Early Diverging Metazoan	<b>Charlotte Brannon</b> <sup>1</sup> , Manu Prakash <sup>2</sup> Departments of Biology <sup>1</sup> and Bioengineering <sup>2</sup> , Stanford University
18	Modeling Tumor Development and Progression for Clinically Challenging Pediatric Glioma	<b>Brandon Bui</b> <sup>1</sup> , Yao Lulu Xing <sup>1</sup> , Ruolun Wei <sup>1</sup> , Alexa Gwyn <sup>1</sup> , Claudia K. Petritsch <sup>1</sup> Department of Neurosurgery <sup>1</sup> , Stanford University
19	Toxic Peptide Digestion by the Human Gut Microbiome – Variation with Fiber and Protein Consumption	<b>August Burton</b> <sup>1</sup> , Richa Sharma <sup>2</sup> , Jonas Cremer <sup>2</sup> Departments of Bioengineering <sup>1</sup> and Biology <sup>2</sup> , Stanford University
20	Exploring Differences in Brain Response to Emotionally Negative Images Among Veterans with Alcohol Use Disorder: Implications for Relapse	<b>Nathanael J. Cadicamo</b> <sup>1</sup> , Daniel M. McCalley <sup>1</sup> , Claudia B. Padula <sup>1,2</sup> Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University; Mental Illness Research Education & Clinical Center <sup>2</sup> , VA Palo Alto Health Care System
21	Striatal Integration of Inverse Dopamine and Serotonin Signals Gates Learning	<b>Daniel F. Cardozo Pinto</b> <sup>1</sup> , Matthew B. Pomrenze <sup>1</sup> , Michaela Y. Guo <sup>1</sup> , Brandon S. Bentzley <sup>2</sup> , Neir Eshel <sup>1</sup> , Robert C. Malenka <sup>1</sup> Nancy Pritzker Laboratory, Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University; Magnus Medical <sup>2</sup>
22	Re-Engraftment of Transplanted Upper Airway Stem Cells to Study Durability of Cystic Fibrosis Airway Sinus Disease Therapy	<b>Natalia Castillo-Ramos</b> <sup>1</sup> , Dawn T. Bravo <sup>1</sup> , Jayakar Nayak <sup>1</sup> Department of Otolaryngology <sup>1</sup> , Stanford University
23	Topological Damping in Ultrafast Giant Cell	<b>Ray Chang</b> <sup>1</sup> , Manu Prakash <sup>1,2</sup> Department of Bioengineering <sup>1</sup> and Woods Institute for the Environment <sup>2</sup> , Stanford University
24	Mapping the Brain's Response to Insomnia Treatment: Implications for Emotional Functioning	<b>Sloan Charles</b> <sup>1</sup> , Adam Krause <sup>1</sup> , Raquel Osorno <sup>1</sup> , Natalie Solomon <sup>1</sup> , Rebecca Bernert <sup>1</sup> , Leanne Williams <sup>1</sup> , James Gross <sup>2</sup> , Laura Lazzeroni <sup>1</sup> , Jerome Yesavage <sup>1</sup> , Rachel Manber <sup>1</sup> , Andrea Goldstein-Piekarski <sup>1</sup> Departments of Psychiatry & Behavioral Sciences <sup>1</sup> and Psychology <sup>2</sup> , Stanford University
25	One-Step Microbial Synthesis of High-Performance Bioplastics with Medical Applications	<b>Sulogna Chatterjee</b> <sup>1</sup> , SungGeun Woo <sup>1</sup> , Craig S. Criddle <sup>1</sup> , Nils J.H. Aversch <sup>1</sup> Department of Civil & Environmental Engineering <sup>1</sup> , Stanford University
26	Navigating Cognitive Control and Memory: The Effects of Encoding Task Difficulty on Multiple Types of Memory	<b>Evie Chen</b> <sup>1</sup> , Haopei Yang <sup>1</sup> , Anthony Wagner <sup>1</sup> Department of Psychology <sup>1</sup> , Stanford University
27	Simulation Studies for Reconstructing Atom Cloud Trajectories at MAGIS-100 Experiment	<b>Andrew Chen</b> <sup>1</sup> , Sanha Cheong <sup>1,2</sup> , Ariel Schwartzman <sup>2</sup> Department of Physics <sup>1</sup> , Stanford University; SLAC National Accelerator Laboratory <sup>2</sup>
28	A Novel Bacterial Transport System for Fatty Acids	<b>Jonathan Chiu-Chun Chou</b> <sup>1,3</sup> , Liting Zhai <sup>1,3</sup> , Hannah Oo <sup>1,3</sup> , Laura M. K. Dassama <sup>1,2,3</sup>

		Departments of Chemistry <sup>1</sup> and Microbiology & Immunology <sup>2</sup> and Sarafan ChEM-H Institute <sup>3</sup> , Stanford University
29	Microfabricated Devices for Applications in Generating Tissue-Derived Organoids and Studying Spatial Omics	<b>Seth C. Cordts</b> <sup>1</sup> , Kanako Yuki <sup>2</sup> , Dalin Zhang <sup>3</sup> , Jesse Gibson <sup>4</sup> , Soham Sinha <sup>4</sup> , Vinh Dao <sup>2</sup> , Saisneha Koppaka <sup>1</sup> , Nicolas Castano <sup>1</sup> , Mark A. Skylar-Scott <sup>4</sup> , James D. Brooks <sup>3</sup> , Bo Wang <sup>4</sup> , Donna Peehl <sup>5</sup> , Calvin J. Kuo <sup>2</sup> , Sindy Tang <sup>1</sup> Departments of Mechanical Engineering <sup>1</sup> , Medicine (Division of Hematology) <sup>2</sup> , Urology <sup>3</sup> , and Bioengineering <sup>4</sup> , Stanford University; Department of Radiology & Biomedical Imaging <sup>5</sup> , University of California San Francisco
30	Understanding the Mechanics of Artificial Meat Using Constitutive Artificial Neural Networks	<b>Archer Date</b> <sup>1</sup> , Magaly Aviles <sup>1</sup> , Yanav Lall <sup>1</sup> , Ethan Darwin <sup>1</sup> , Skyler St. Pierre <sup>1</sup> , Marc Levenston <sup>1</sup> , Ellen Kuhl <sup>1</sup> Department of Mechanical Engineering <sup>1</sup> , Stanford University
31	Implementation of an Ultra-Stable Optical Transfer Cavity for Laser Frequency Stabilization	<b>Kapil Dheeriy</b> <sup>1</sup> , Lavanya Taneja <sup>2,4</sup> , Zeyang Li <sup>3</sup> , Jonathan Simon <sup>1,3</sup> Departments of Physics <sup>1</sup> and Applied Physics <sup>3</sup> , Stanford University; Department of Physics <sup>2</sup> and The James Franck Institute <sup>4</sup> , University of Chicago
32	Role of a Thioredoxin-Containing <i>Toxoplasma</i> Protein in the Interaction between This Intracellular Parasite and the Human Cells It Infects	<b>Julia DiCicc</b> <sup>1</sup> , Alma Mendoza <sup>1</sup> , John Boothroyd <sup>1</sup> Department of Microbiology & Immunology <sup>1</sup> , Stanford University
33	Cortisol to DHEA Ratio as a Biological Mechanism for Social Anxiety through Adolescence	<b>Gwendolyn Donahue</b> <sup>1</sup> , Yoonji Lee <sup>2</sup> , Ian H. Gotlib <sup>2</sup> Departments of Biology <sup>1</sup> and Psychology <sup>2</sup> , Stanford University
34	The Dials of Transcription: Measuring and Perturbing Transcription Factor Binding and Gene Expression on Single Molecules in Cells	<b>Benjamin Doughty</b> <sup>1*</sup> , <b>Julia Schaepe</b> <sup>2*</sup> , Michaela Hinks <sup>2*</sup> , Georgi Marinov <sup>1</sup> , Abby Thurm <sup>2</sup> , Carolina Rios-Martinez <sup>2</sup> , Jason Tan <sup>3</sup> , Danilo Dubocanin <sup>1</sup> , Emil Marklund <sup>1</sup> , Benjamin Parks <sup>3</sup> , Lacramioara Bintu <sup>2</sup> †, William Greenleaf <sup>1</sup> † (*† equal contribution) Departments of Genetics <sup>1</sup> , Bioengineering <sup>2</sup> and Computer Science <sup>3</sup> , Stanford University
35	Investigating the Role of Endocytic Rab GTPases in Neural Circuit Assembly	<b>Katie Dong</b> <sup>1,2</sup> , Colleen McLaughlin <sup>1,2</sup> , Liqun Luo <sup>1,2</sup> Department of Biology <sup>1</sup> and Howard Hughes Medical Institute <sup>2</sup> , Stanford University
36	Bench-Top Heart Model and Sheath Design for Cardiac Ablation via Subxiphoid Access	<b>Angelina Duran</b> <sup>1</sup> , Meg Babakhanian <sup>1</sup> , Paul Wang <sup>1</sup> Departments of Cardiovascular Medicine <sup>1</sup> and Bioengineering <sup>2</sup> , Stanford University
37	Polymer Dynamics Model Towards Reconstructing Chromatin Connectivity	<b>Sayantana Dutta</b> <sup>1</sup> , Ashesh Ghosh <sup>1</sup> , Andrew J. Spakowitz <sup>1,2</sup> Departments of Chemical Engineering <sup>1</sup> and Materials Science & Engineering <sup>2</sup> , Stanford University
38	Glucose Starvation Induces Modification of the Arp5 and Arp8 Subunits of the INO80 Complex	<b>Cameron Ehsan</b> <sup>1</sup> , Keith Garcia <sup>1</sup> , Ashby J. Morrison <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
39	Stereoscopic Calibration for Augmented Reality Visualization in Microscopic Surgery	<b>Trishia El Chemaly</b> <sup>1,2,3</sup> , Caio Athayde Neves <sup>2,4</sup> , Christoph Leuze <sup>3,5</sup> , Brian Hargreaves <sup>1,3,6</sup> , Nikolas H. Blevins <sup>2</sup> Departments of Bioengineering <sup>1</sup> , Otolaryngology <sup>2</sup> , Radiology <sup>3</sup> , and Electrical Engineering <sup>6</sup> and Wu Tsai Neurosciences Institute <sup>5</sup> , Stanford University; Faculty of Medicine <sup>4</sup> , University of Brasília
40	Unraveling Neurogenetic Complexity: Utilizing Polygenic Risk Scores to Probe Susceptibility to Neuropsychiatric Disorders	<b>Mohamed Zahir Elhassan</b> <sup>1</sup> , Mira Michelle Raman <sup>1</sup> , Tamar Green <sup>1</sup> The Brain Imaging, Development & Genetics (BRIDGE) Lab, Department of Psychiatry & Behavioral Sciences – Interdisciplinary Brain Sciences <sup>1</sup> , Stanford University
41	Hair Me Out: Phenotypic Inclusion using fNIRS and Increasing Equity in Neuroscience	<b>Cassandra Eng</b> <sup>1</sup> , <b>Noor Hassan</b> <sup>2</sup> , Eli Wandless <sup>2</sup> , Suanna Moron <sup>1</sup> , Yuanyuan Gao <sup>1</sup> , Allan Reiss <sup>1</sup> Departments of Psychiatry & Behavioral Sciences <sup>1</sup> and Symbolic Systems <sup>2</sup> , Stanford University

42	MSKC – Stanford Shared Center for Bioresearch	<b>Daniel Fernandez</b> <sup>1</sup> , Olivia Pattelli <sup>1</sup> Sarafan ChEM-H <sup>1</sup> , Stanford University
43	A Role for Small GTPase Rab2a in Osteoblast Differentiation and Mineralization	<b>Kim Fernandez-Winters</b> <sup>1</sup> , Hui Zhu <sup>1</sup> , Joy Wu <sup>1</sup> Department of Endocrinology <sup>1</sup> , Stanford University
44	Evolution of Evolvability in Rapidly Adapting Populations	<b>James Ferrare</b> <sup>1</sup> , Benjamin Good <sup>2</sup> Biophysics Program <sup>1</sup> and Department of Applied Physics <sup>2</sup> , Stanford University
45	Kirigami-Electronics to Interface Organoids	<b>Csaba Forró</b> <sup>1</sup> , Xiao Yang <sup>1,2,3</sup> , Thomas L. Li <sup>1,2,3</sup> , Yuki Miura <sup>2,3</sup> , Tomasz J. Zaluska <sup>1</sup> , Ching-Ting Tsai <sup>1</sup> , Sabina Kanton <sup>2,3</sup> , James P. McQueen <sup>2,3</sup> , Xiaoyu Chen <sup>2,3</sup> , Sergiu P. Paşca <sup>2,3,4,5,*</sup> , Bianxiao Cui <sup>1,4,5,*</sup> (*corresponding authors) Departments of Chemistry <sup>1</sup> and Psychiatry & Behavioral Sciences <sup>2</sup> , Stanford Brain Organogenesis <sup>3</sup> , Wu Tsai Neurosciences Institute <sup>4</sup> , and Stanford Bio-X <sup>5</sup> , Stanford University
46	Electrical Model of the Cell-Electrode Interface: Flat and 3D Electrodes	<b>Csaba Forró</b> <sup>1</sup> , Tomasz J. Zaluska <sup>1</sup> , Ching-Ting Tsai <sup>1</sup> , Yang Yang <sup>1</sup> , Bianxiao Cui <sup>1*</sup> , Holger Mueller <sup>2*</sup> (*corresponding authors) Department of Chemistry <sup>1</sup> , Stanford University; Department of Physics <sup>2</sup> , University of California Berkeley
47	CryoEM Reveals Dual-Inhibition Mechanisms and Explains the Differential Neutralization Potency of Two Anti-CHIKV Antibodies	Guan-Chin Su <sup>1*</sup> , <b>Jesús G. Galaz-Montoya</b> <sup>1*</sup> , Grigore Pintilie <sup>1</sup> , Jing Jin <sup>2,3</sup> , Wah Chiu <sup>1,4,5</sup> (*equal contribution) Departments of Bioengineering <sup>1</sup> and Microbiology & Immunology <sup>4</sup> and Division of CryoEM & Bioimaging, SSRL, SLAC National Accelerator Laboratory <sup>5</sup> , Stanford University; Vitalant Research Institute <sup>2</sup> ; Department of Laboratory Medicine <sup>3</sup> , University of California San Francisco
48	Identifying Synaptic Cell Adhesion Molecule <i>Cdh6</i> as a Label and Tool to Manipulate Sensory Neurons in the Mouse Enteric Nervous System	<b>Julieta Gomez-Frittelli</b> <sup>1,2</sup> , Gabrielle Devienne <sup>2,3</sup> , Lee Travis <sup>4</sup> , Xin Duan <sup>5</sup> , Nick J. Spencer <sup>4</sup> , John Huguenard <sup>2,3</sup> , Julia A. Kaltschmidt <sup>2,6</sup> Departments of Chemical Engineering <sup>1</sup> , Neurology & Neurological Sciences <sup>3</sup> , and Neurosurgery <sup>6</sup> and Wu Tsai Neurosciences Institute <sup>2</sup> , Stanford University; College of Medicine & Public Health <sup>4</sup> , Flinders University; Department of Ophthalmology <sup>5</sup> , University of California San Francisco
49	Assessing Behavioral Patterns in Children from Resting-State fMRIs	<b>Camila González</b> <sup>1</sup> , Qingyu Zhao <sup>1</sup> , Ehsan Adeli <sup>1</sup> , Orsolya Kiss <sup>2</sup> , Kilian M. Pohl <sup>1</sup> Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University; Center for Health Sciences <sup>2</sup> , SRI International
50	The Aging Knee: Changes in Bone Metabolic Activity Measured Using [ <sup>18</sup> F] NaF PET-MR Imaging	<b>Ananya Goyal</b> <sup>1</sup> , Yael Vainberg <sup>1</sup> , Jessica Asay <sup>1</sup> , Min Yoon <sup>1</sup> , Feliks Kogan <sup>1</sup> Department of Radiology <sup>1</sup> , Stanford University
51	Machine Learning Analysis of Gait to Discriminate Between Musculoskeletal Pain States in Mice	<b>Nicholas S. Gregory</b> <sup>1</sup> , Boris D. Heifets <sup>1</sup> Department of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> , Stanford University
52	Novel Bioorthogonal Mouse Models and AAVs for Cell-Type-Specific Proteome Labeling	<b>Ian H. Guldner</b> <sup>1,2</sup> , Sophia M. Shi <sup>1,2</sup> , Patricia Moran-Losada <sup>1,2</sup> , Kelly Chen <sup>1,2</sup> , Steven R. Shuken <sup>1,2</sup> , Mike Sasner <sup>3</sup> , Andrew C. Yang <sup>4,5</sup> , Tony Wyss-Coray <sup>1,2,6,7</sup> Department of Neurology & Neurological Sciences <sup>1</sup> , Wu Tsai Neurosciences Institute <sup>2</sup> , Paul F. Glenn Center for the Biology of Aging <sup>6</sup> , and The Knight Initiative for Brain Resilience <sup>7</sup> , Stanford University; The Jackson Laboratory <sup>3</sup> ; Department of Anatomy <sup>4</sup> and Bakar Aging Research Institute <sup>5</sup> , University of California San Francisco
53	Modeling Wilms Tumor in ALI Kidney Organoids	<b>Alyssa Guo</b> <sup>1</sup> , Xavier Gaeta <sup>2</sup> , Calvin Kuo <sup>3</sup> Departments of Chemistry <sup>1</sup> , Pediatrics <sup>2</sup> , and Hematology <sup>3</sup> , Stanford University
54	Exploring Alkaloid Binding Proteins in Poison Frogs	<b>Cyrus Hajian</b> <sup>1</sup> , Aurora Alvarez-Buylla <sup>1</sup> , Dave Ramirez <sup>1</sup> , Lauren O'Connell <sup>1</sup>

		Department of Biology <sup>1</sup> , Stanford University
55	Atmospheric and Lab Measurements of Optical Absorption Lines for Wetland Methane Emission Monitoring	<b>Liam Harrison</b> <sup>1</sup> , Olivia Walsh <sup>2,3</sup> , Cassandra Huff <sup>1</sup> , Leo Hollberg <sup>1</sup> Department of Physics <sup>1</sup> , Stanford University; Departments of Physics <sup>2</sup> and Astronomy <sup>3</sup> , Cal Poly Pomona
56	Serine Starvation Silences Estrogen Receptor Signaling through Histone Hypoacetylation	Albert M. Li <sup>1,2,†</sup> , <b>Bo He</b> <sup>1,†</sup> , Dimitris Karagiannis <sup>7</sup> , Yang Li <sup>1</sup> , Haowen Jiang <sup>1</sup> , Preethi Srinivasan <sup>3,4,5</sup> , Yaniel Ramirez <sup>1</sup> , Meng-Ning Zhou <sup>1</sup> , Christina Curtis <sup>2,3,4,5</sup> , Joshua J. Gruber <sup>6</sup> , Chao Lu <sup>7</sup> , Erinn B. Rankin <sup>1,2,5</sup> , Jiangbin Ye <sup>1,2,5*</sup> (†equal contribution, *corresponding author) Departments of Radiation Oncology <sup>1</sup> , Medicine <sup>3</sup> , and Genetics <sup>4</sup> , Cancer Biology Program <sup>2</sup> , and Stanford Cancer Institute <sup>5</sup> , Stanford University; Simmons Comprehensive Cancer Center <sup>6</sup> , University of Texas Southwestern Medical Center; Department of Genetics & Development <sup>7</sup> , Columbia University
57	Allosteric Modulation and G-Protein Selectivity by the Calcium-Sensing Receptor	<b>Feng He</b> <sup>1*</sup> , Cheng-Guo Wu <sup>1*</sup> , Yang Gao <sup>1*</sup> , Sabrina N. Rahman <sup>2*</sup> , Magda Zaoralová <sup>1</sup> , Makaia M. Papisergi-Scott <sup>1</sup> , Ting-Jia Gu <sup>3</sup> , Michael J. Robertson <sup>1</sup> , Alpay B. Seven <sup>1</sup> , Lingjun Li <sup>3</sup> , Jesper M. Mathiesen <sup>2</sup> , Georgios Skiniotis <sup>1,4</sup> (*equal contribution) Departments of Molecular & Cellular Physiology <sup>1</sup> and Structural Biology <sup>4</sup> , Stanford University; Department of Drug Design & Pharmacology <sup>2</sup> , Faculty of Health & Medical Sciences, University of Copenhagen; School of Pharmacy <sup>3</sup> , University of Wisconsin–Madison
58	The Impact of Sleep Disorders and APOE Status on Depression Severity and its Relationship with Cognitive Decline	<b>Lauren He</b> <sup>1</sup> , William Giardino <sup>1</sup> , Windy McNerney <sup>1,2</sup> , Alesha Heath <sup>1,2</sup> , Andrea Goldstein-Piekarski <sup>1,2</sup> Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University; Mental Illness Research & Education Clinical Centers (MIRECC) <sup>2</sup> , Palo Alto Veterans Affairs Health Care System
59	Toward Bacterial Wastewater Monitoring with Surface-Enhanced Raman Spectroscopy and Deep Learning	<b>Liam Herndon</b> <sup>1</sup> , Yirui Zhang <sup>2</sup> , Babatunde Ogunlade <sup>2</sup> , Fareeha Safir <sup>3</sup> , Halleh Balch <sup>2</sup> , Kai Chang <sup>4</sup> , Alexandria Boehm <sup>5</sup> , Jennifer Dionne <sup>2</sup> Departments of Chemical Engineering <sup>1</sup> , Materials Science & Engineering <sup>2</sup> , Mechanical Engineering <sup>3</sup> , Electrical Engineering <sup>4</sup> , and Civil & Environmental Engineering <sup>5</sup> , Stanford University
60	Self-Learning Mechanical Circuits	<b>Ian Ho</b> <sup>1*</sup> , Vishal P. Patil <sup>1*</sup> , Manu Prakash <sup>1</sup> (*co-first author) Department of Bioengineering <sup>1</sup> , Stanford University
61	Drug Counterfeits – Trace Elemental Patterns in Pharmaceuticals	<b>Else Holmfred</b> <sup>1</sup> , Abdulla Alrijjal <sup>2</sup> , C. Page Chamberlain <sup>1</sup> , Katharine Maher <sup>1</sup> , Stefan Stürup <sup>2</sup> Earth System Sciences <sup>1</sup> , Stanford University; Department of Pharmacy <sup>2</sup> , University of Copenhagen
62	Tunable Hydrogel Viscoelasticity Modulates Human Neural Maturation	<b>Michelle S. Huang</b> <sup>1</sup> , Julien G. Roth <sup>2</sup> , Renato S. Navarro <sup>3</sup> , Jason T. Akram <sup>3</sup> , Bauer L. LeSavage <sup>4</sup> , Sarah C. Heilshorn <sup>3</sup> Departments of Chemical Engineering <sup>1</sup> , Stem Cell Biology & Regenerative Medicine <sup>2</sup> , Materials Science & Engineering <sup>3</sup> , and Bioengineering <sup>4</sup> , Stanford University
63	Exploring the Role of Chromatin Regulators in Human Cortical Development	<b>Zuzana Hudacova</b> <sup>1</sup> , Alfredo M. Valencia <sup>1</sup> , Kevin Kelley <sup>1</sup> , Massimo Onesto <sup>1</sup> , Ji-il Kim <sup>1</sup> , Sergiu P. Pasca <sup>1</sup> Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University
64	Trem-1 and EP2 Effects on Chronic Inflammation and Aging	<b>Michael James</b> <sup>1</sup> , Akhilesh Srivathsa, Sanjan Sen, Mohammad Torabi, Jonathan Joseph, Katrin Andreasson <sup>3</sup> , Jill Helms <sup>2</sup>

		Departments of Physics <sup>1</sup> , Surgery <sup>2</sup> , and Neurology & Neurological Sciences <sup>3</sup> , Stanford University
65	Novel Aldehyde Dehydrogenase 2 Variants in Africans/African Americans Affect Acetaldehyde Metabolism	<b>Tanaz Jamilpanah</b> <sup>1</sup> , Maya Goldsberry <sup>1</sup> , Freeborn Rwere <sup>1</sup> , Eric R. Gross <sup>1</sup> Department of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> , Stanford University
66	$\beta$ -arrestin C-tail Dynamics Regulate Activation and GPCR Engagement	<b>John Janetzko</b> <sup>1</sup> , Asuka Inoue <sup>2</sup> , Yuqi Shi <sup>3</sup> , Dirk H. Seipe <sup>1</sup> , Jonathan C. Deutsch <sup>1</sup> , Korak Kumar Ray <sup>4</sup> , Matthieu Masureel <sup>1</sup> , Ruben L. Gonzalez <sup>4</sup> , Rosa Viner <sup>3</sup> , Rabindra Shivnaraine <sup>1</sup> , Brian K. Kobilka <sup>1</sup> Department of Molecular & Cellular Physiology <sup>1</sup> , Stanford University; Tohoku University <sup>2</sup> ; Thermo Fisher Scientific <sup>3</sup> ; Department of Chemistry <sup>4</sup> , Columbia University
67	Experimental Studies of Ionization-Induced Modulation of Optical Properties in Crystals for 10ps Time-of-Flight Positron Emission Tomography (PET)	<b>Diana Jeong</b> <sup>1</sup> , Yushin Kim <sup>1</sup> , R. Coffee <sup>2</sup> , Craig Levin <sup>1</sup> Department of Radiology <sup>1</sup> , Stanford University; SLAC National Accelerator Laboratory <sup>2</sup>
68	Engineering Charge-Altering Releasable Transporters for Intradermal RNA Vaccine Applications	<b>Yuan Jia</b> <sup>1</sup> , Summer Ramsay-Burrough <sup>1</sup> , Yue Xu <sup>2,3</sup> , Netra U. Rajesh <sup>4</sup> , Madison M. Driskill <sup>2</sup> , Joseph M. DeSimone <sup>2,3</sup> , Robert M. Waymouth <sup>1</sup> Departments of Chemistry <sup>1</sup> , Chemical Engineering <sup>2</sup> , Radiology <sup>3</sup> , and Bioengineering <sup>4</sup> , Stanford University
69	Unlock the Maturation Block in Neuroblastoma by the Combination of NEN and Retinoic Acid	<b>Haowen Jiang</b> <sup>1</sup> , Sarah Jane Tiche <sup>2</sup> , Clifford JiaJun He <sup>1</sup> , Bo He <sup>1</sup> , Yang Li <sup>1</sup> , Albert Li <sup>1</sup> , Balint Forgo <sup>3</sup> , Florette Kimberly Gray Hazard <sup>2</sup> , Hiroyuki Shimada <sup>3</sup> , Bill Chiu <sup>2</sup> , Jiangbin Ye <sup>1</sup> Departments of Radiation Oncology <sup>1</sup> , Surgery <sup>2</sup> , and Pathology <sup>3</sup> , Stanford University
70	Harnessing PEG-Based Hydrogels with Tunable Stress Relaxation for Enhancing Stem-Cell Chondrogenesis and Cartilage Repair	<b>Julia Johannsen</b> <sup>1</sup> , Sarah Jones <sup>2</sup> , Xinming Tong <sup>3</sup> , Fan Yang <sup>3,4</sup> Departments of Biology <sup>1</sup> , Chemistry <sup>2</sup> , Orthopaedic Surgery <sup>3</sup> , and Bioengineering <sup>4</sup> , Stanford University
71	Adaptable Sliding Hydrogels with Dynamic Crosslinks as a 3D Cell Niche for Enhancing Cartilage Regeneration	<b>Sarah Jones</b> <sup>1</sup> , Julia Johannsen <sup>2</sup> , Xinming Tong <sup>3</sup> , Manish Ayushman <sup>4</sup> , Fan Yang <sup>3,4</sup> Departments of Chemistry <sup>1</sup> , Biology <sup>2</sup> , Orthopaedic Surgery <sup>3</sup> , and Bioengineering <sup>4</sup> , Stanford University
72	Understanding the Developmental Interplay Between the Trochlea and Physis Using Machine Learning and Statistical Shape Models	<b>Bryan Khoo</b> <sup>1</sup> , Anthony Gatti <sup>2</sup> , Marissa Lee <sup>3</sup> , Christian Wright <sup>4</sup> , Amin Alayleh <sup>5</sup> , Seth Sherman <sup>5</sup> , Akshay Chaudhari <sup>2</sup> , Kevin Shea <sup>5</sup> Departments of Management Science & Engineering <sup>1</sup> , Radiology <sup>2</sup> , Mechanical Engineering <sup>3</sup> , Biology <sup>4</sup> and Orthopaedic Surgery <sup>5</sup> , Stanford University
73	3D Bioprinting of Bio-orthogonally Crosslinkable Collagen to Study the Ovarian Cancer Tumor Microenvironment	<b>David Kilian</b> <sup>1</sup> , Lucia G. Brunel <sup>2</sup> , Fotis Christakopoulos <sup>1</sup> , Betty Cai <sup>1</sup> , Erinn B. Rankin <sup>3,4</sup> , Sarah C. Heilshorn <sup>1</sup> Departments of Materials Science & Engineering <sup>1</sup> , Chemical Engineering <sup>2</sup> , Radiation Oncology <sup>3</sup> , and Obstetrics & Gynecology <sup>4</sup> , Stanford University
74	15-PGDH Inhibition as an Antifibrotic for Dilated Cardiomyopathy	<b>Ireh Kim</b> <sup>1,2</sup> , Minas Nalbandian <sup>1,2</sup> , Helen Blau <sup>1,2</sup> Baxter Laboratory for Stem Cell Biology <sup>1</sup> and Department of Microbiology & Immunology, Institute for Stem Cell Biology & Regenerative Medicine <sup>2</sup> , Stanford University
75	Investigating Cerebellar Activity During Freely-Moving Social Behavior in Mice	<b>Jaeah Kim</b> <sup>1</sup> , Peter Y. Wang <sup>1</sup> , Charu Ramakrishnan <sup>1,4</sup> , Karl Deisseroth <sup>1,2,3,4</sup> Departments of Bioengineering <sup>1</sup> and Psychiatry & Behavioral Sciences <sup>4</sup> , Howard Hughes Medical Institute <sup>2</sup> , and CNC Program <sup>3</sup> , Stanford University
76	Characterizing the Effect of Aging on Stem Cell Osteogenesis and Immunomodulation: A 3D Biomaterials-Based Approach	<b>Tayne Kim</b> <sup>1</sup> , Ni Su <sup>2</sup> , Cassandra Villicana <sup>1</sup> , Sungwon Kim <sup>2</sup> , Fan Yang <sup>1,2</sup> Departments of Bioengineering <sup>1</sup> and Orthopaedic Surgery <sup>2</sup> , Stanford University

77	Elucidating Cell Size Control Mechanisms at the G1/S Transition	<b>Joshua J. Konschnik</b> <sup>1</sup> , Cecelia Brown Fleming <sup>2</sup> , Félix Proulx-Giraldeau <sup>3</sup> , Benjamin Reyes Topacio <sup>4</sup> , Paul François <sup>3</sup> , Mardo Kõivomägi <sup>5</sup> , Jan M. Skotheim <sup>2</sup> Departments of Mathematics <sup>1</sup> and Biology <sup>2</sup> , Stanford University; Department of Biochemistry & Molecular Medicine <sup>3</sup> , University of Montreal; Department of Chemistry & Biochemistry <sup>4</sup> , University of California-Santa Cruz; National Cancer Institute <sup>5</sup>
78	Modeling Ovarian Cancer Pathogenesis in Epithelial Cells of Human Fallopian Tube	<b>Judith Kraiczyl</b> <sup>1</sup> , Edward Nguyen <sup>1</sup> , Carla López <sup>2</sup> , David Hawke <sup>1</sup> , Sarah C. Heilshorn <sup>2</sup> , Bo Yu <sup>1</sup> Department of Obstetrics & Gynecology <sup>1</sup> and Materials Science & Engineering <sup>2</sup> , Stanford University
79	3D, Shape-Specific, Scalable, Micro-Fabricated Particle Production via Roll-to-Roll Printing and Continuous Liquid Interface Production (r2rCLIP)	<b>Jason M. Kronenfeld</b> <sup>1</sup> , Lukas Rother <sup>2</sup> , Max A. Saccone <sup>2,3</sup> , Maria T. Dulay <sup>2</sup> , Joseph M. DeSimone <sup>2,3</sup> Departments of Chemistry <sup>1</sup> , Radiology <sup>2</sup> , and Chemical Engineering <sup>3</sup> , Stanford University
80	Self-Supervised Pretraining for Surgical Semantic Segmentation	<b>Abhinav Kumar</b> <sup>1</sup> , Cyril Zakka <sup>2</sup> , William Hiesinger <sup>2</sup> Departments of Computer Science <sup>1</sup> and Cardiothoracic Surgery <sup>2</sup> , Stanford University
81	Construction of Synthetic Cell with a Cytoskeleton Using 2-Photon Polymerization and Microfluidic Methods	<b>Myra Kurosu Jalil</b> <sup>1</sup> , Saisneha Koppaka <sup>1</sup> , Sindy K.Y. Tang <sup>1</sup> Department of Mechanical Engineering <sup>1</sup> , Stanford University
82	Intracranial Study of the Human Memory and Language Networks	<b>Abby Kwon</b> <sup>1</sup> , Zoe Lusk <sup>1</sup> , James Stieger <sup>1</sup> , Josef Parvizi <sup>1</sup> Department of Neurology & Neurological Sciences <sup>1</sup> , Stanford University
83	Probing the Mechanism of Action of Allopathic Compounds Secreted by Rice	<b>Chloe Laguna Logan</b> <sup>1</sup> , Diego Wengier <sup>2</sup> , Tara Lowensohn <sup>3</sup> , Elizabeth Sattely <sup>2</sup> Departments of Bioengineering <sup>1</sup> , Chemical Engineering <sup>2</sup> and Chemistry <sup>3</sup> , Stanford University
84	FXVD5 Overexpression Plays a Role in Prostate Cancer Tumor Suppression	<b>Nathan Lam</b> <sup>1</sup> , Zhengyuan Qiu <sup>1</sup> , Ru M. Wen <sup>1</sup> , Hongjuan Zhao <sup>1</sup> , James D. Brooks <sup>1</sup> Department of Urology <sup>1</sup> , Stanford University
85	A Sequential AI Model with Short- and Long-Range Video Representation for High-Performance Bladder Tumor Classification Using a Benchmark Cystoscopy Dataset	<b>Mark Laurie</b> <sup>1,2,5</sup> , Okyaz Eminaga <sup>1,3,5</sup> , Md Tauhidul Islam <sup>2</sup> , Eugene Shkolyar <sup>1,5</sup> , Xiao Jia <sup>1</sup> , Timothy Lee <sup>1,5</sup> , Jin Long <sup>3</sup> , Hubert Lau <sup>4,5</sup> , Lei Xing <sup>2</sup> , Joseph C. Liao <sup>1,3,5*</sup> (*corresponding author) Departments of Urology <sup>1</sup> , Radiation Oncology <sup>2</sup> , and Pathology <sup>4</sup> and Center for Artificial Intelligence & Medical Imaging <sup>3</sup> , Stanford University; VA Palo Alto Health Care System <sup>5</sup>
86	Elephant Trunk Inspired Soft Robotic Arm via Liquid Crystal Elastomers	<b>Sophie Leanza</b> <sup>1</sup> , Juliana Lu-Yang <sup>1</sup> , Bartosz Kaczmarek <sup>1</sup> , Shuai Wu <sup>1</sup> , Ellen Kuhl <sup>1</sup> , Ruike Renee Zhao <sup>1</sup> Department of Mechanical Engineering <sup>1</sup> , Stanford University
87	Predicting Cutaneous Leishmaniasis in Brazil: A Machine Learning Model of Reforestation, Climate, and Land Use	<b>Alexandra S. Lee</b> <sup>1</sup> , Kelsey Lyberger <sup>1</sup> , Caroline Glidden <sup>1</sup> , Erin Mordecai <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
88	Biomarker Analysis of Intralesional Neoadjuvant Therapy for High-Risk Stage II Melanoma: A Phase II Clinical Trial	<b>David Lee</b> <sup>2</sup> , M. Usman Ahmad <sup>1</sup> , Mamatha Serasembati <sup>1</sup> , Saurabh Sharma <sup>1</sup> , Alison B. Warner <sup>1</sup> , Amanda R. Kirane <sup>1</sup> Department of General Surgery <sup>1</sup> , Stanford University; School of Medicine <sup>2</sup> , Loma Linda University
89	Collateralized Projections From the Paraventricular Thalamus Mediate Mouse Social Pain Behavior	<b>Emily Li</b> <sup>1</sup> , Yuan Yuan <sup>1</sup> , Xiaoke Chen <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
90	Charge-Altering Releasable Transporters with a Distinct Polymeric Backbone Enhance mRNA Delivery <i>in vitro</i> and Exhibit <i>in vivo</i> Tropism	<b>Zhijian Li</b> <sup>1†</sup> , Laura Amaya <sup>2,5†</sup> , Ruoxi Pi <sup>6</sup> , Sean K. Wang <sup>2,8</sup> , Alok Ranjan <sup>1</sup> , Robert M. Waymouth <sup>1</sup> , Catherine A. Blish <sup>6,7</sup> , Howard Y. Chang <sup>2,4</sup> , Paul A. Wender <sup>1,3*</sup> (†equal contribution, *corresponding author) Departments of Chemistry <sup>1</sup> , Chemical & Systems Biology <sup>3</sup> , Medicine (Division of Infectious Diseases & Geographic Medicine) <sup>6</sup> , and Ophthalmology <sup>8</sup> , Center for Personal Dynamic Regulomes <sup>2</sup> , Howard Hughes Medical Institute <sup>4</sup> , and Institute for Stem Cell Biology & Regenerative

		Medicine <sup>5</sup> , Stanford University; Chan Zuckerberg Biohub <sup>7</sup>
91	Biology-Aware Mutation-Based Deep Learning for Outcome Prediction of Cancer Immunotherapy with Immune Checkpoint Inhibitors	<b>Junyan Liu</b> <sup>1</sup> , Md Tauhidul Islam <sup>1</sup> , Shengtian Sang <sup>1</sup> , Liang Qiu <sup>1</sup> , Lei Xing <sup>1</sup> Department of Radiation Oncology <sup>1</sup> , Stanford University
92	Design of an Intrinsically Stretchable, Photo-Patternable n-type Polymer Semiconductor Towards Stretchable Complementary Circuits	<b>Qianhe (Kelly) Liu</b> <sup>1</sup> , Zhenan Bao <sup>1</sup> Department of Chemical Engineering <sup>1</sup> , Stanford University
93	CausalEGM: A General Causal Inference Framework by Encoding Generative Modeling	<b>Qiao Liu</b> <sup>1</sup> , Zhongren Chen <sup>1</sup> , Wing Hung Wong <sup>1</sup> Department of Statistics <sup>1</sup> , Stanford University
94	Post-Anesthetic Cognitive Changes in a Rodent Model of Alcohol Intolerance	<b>Yixi Liu</b> <sup>1</sup> , Candida L. Goodnough <sup>1</sup> , Erica Cartusciello <sup>1</sup> , Erin Floranda <sup>1</sup> , Eric R. Gross <sup>1</sup> Department of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> , Stanford University
95	Cortical Gray Matter Structure in Adolescents with Klinefelter Syndrome	<b>Genessi Lizama</b> <sup>1</sup> , Anna Kiesewetter <sup>1</sup> , Annie Vo <sup>1</sup> , Rachel Bahk <sup>1</sup> , Lara Folland-Ross <sup>1</sup> , Allan Reiss <sup>1</sup> Center for Interdisciplinary Brain Sciences Research <sup>1</sup> , Stanford University
96	Cryogenic Helmholtz Coil System: Design, Analysis, and Applications	<b>Raymond Llata</b> <sup>1</sup> , David Goldfinger <sup>1</sup> , Shawn Henderson <sup>1</sup> , Prakanya Agrawal <sup>1</sup> , Kirit Karkare <sup>1</sup> , Andrew Miskovich <sup>1</sup> , Zeshan Ahmed <sup>1</sup> , Jake Connors <sup>2</sup> SLAC National Accelerator Laboratory <sup>1</sup> ; National Institute of Standards and Technology <sup>2</sup>
97	Cell-Specific Mapping of Lipid Accumulation in Alzheimer's Disease	<b>Christopher Long</b> <sup>1</sup> , Patrik Johansson <sup>1</sup> , Michael Haney <sup>2</sup> , Christy Munson <sup>2</sup> , Tony Wyss-Coray <sup>2</sup> , Annika Enejder <sup>1</sup> , Sarah Heilshorn <sup>1</sup> Departments of Materials Science & Engineering <sup>1</sup> and Neurology & Neurological Sciences <sup>2</sup> , Stanford University
98	Unlocking Immunity: Evaluating Cross-Reactive Coronavirus Antibodies Against Diverse Omicron Variants for a Pan-Sarbecovirus Vaccine	<b>Jasmyn Lopez</b> <sup>1,2,3</sup> , Morgan Abernathy <sup>1,3</sup> , Christopher O. Barnes <sup>1,2,3,4</sup> Department of Biology <sup>1</sup> , Stanford Bio-X <sup>2</sup> , and Sarafan ChEM-H <sup>3</sup> , Stanford University; Chan Zuckerberg Biohub <sup>4</sup>
99	Using Machine Learning to Understand the Role of Gaze in Marmoset Social Decision Making	<b>Noah Lowe</b> <sup>1</sup> , Tohar Sion Yarden <sup>1</sup> , Melinda Zhu <sup>1</sup> , Keren Haroush <sup>1</sup> Department of Neurobiology <sup>1</sup> , Stanford University
100	Unveiling the Molecular Mechanism of Integrin $\beta$ 5-Mediated Curved Adhesions	<b>Chih-Hao Lu</b> <sup>1,2,3</sup> , Wei Zhang <sup>1,2,3</sup> , Bianxiao Cui <sup>1,2,3,4*</sup> (*corresponding author) Department of Chemistry <sup>1</sup> , Wu-Tsai Neuroscience Institute <sup>2</sup> , Sarafan ChEM-H <sup>3</sup> , and Stanford Bio-X <sup>4</sup> , Stanford University
101	Linkage Equilibrium Between Rare Alleles	<b>Anastasia Lyulina</b> <sup>1,2*</sup> , Zhiru Liu <sup>2*</sup> , Benjamin Good <sup>1,2,3</sup> (*equal contribution) Departments of Biology <sup>1</sup> and Applied Physics <sup>2</sup> , Stanford University; Chan Zuckerberg Biohub <sup>3</sup>
102	Multi-Crystal Diffraction Data Reduction in a Bayesian Framework	<b>Doris Mai</b> <sup>1,2</sup> , Ariana Peck <sup>1</sup> , Kevin Dalton <sup>3</sup> , Frédéric Poitevin <sup>1</sup> , Hosea Nelson <sup>2</sup> Linac Coherent Light Source <sup>1</sup> , SLAC National Accelerator Laboratory, Stanford University; Division of Chemistry & Chemical Engineering <sup>2</sup> , California Institute of Technology; Department of Molecular & Cellular Biology <sup>3</sup> , Harvard University
103	Simulating Large-Scale Simulations in Retinal Brain-Computer Interfaces (BCIs)	<b>Robby Manihani</b> <sup>1,2</sup> , Raman Vilku <sup>1,2</sup> , Subhasish Mitra <sup>1,2</sup> Departments of Electrical Engineering <sup>1</sup> and Computer Science <sup>2</sup> , Stanford University
104	Towards Deep Tissue Multimolecular Imaging with Nonlinear Ultrasound	<b>G. Edward Marti</b> <sup>1</sup> , <b>Kaitlyn Liang</b> <sup>2</sup> , Cheng Liu <sup>1</sup> , James D. Brooks <sup>3</sup> , Jeremy J. Dahl <sup>2</sup> , Steven Chu <sup>1,4</sup> Departments of Molecular & Cellular Physiology <sup>1</sup> , Radiology <sup>2</sup> , Urology <sup>3</sup> , and Physics <sup>4</sup> , Stanford University
105	Real-Time Red Blood Cell Segmentation on Edge Hardware for Malaria Microscopy	<b>Kevin Marx</b> <sup>1</sup> , Wei Ouyang <sup>1</sup> , John Welsh <sup>2</sup> , Manu Prakash <sup>1</sup> , Hongquan Li <sup>1</sup> Department of Bioengineering <sup>1</sup> , Stanford University; NVIDIA Corporation <sup>2</sup>



106	Determining the Role of Calcineurin on Nuclear Transport Under Oxidative Stress	<b>Jaston B. McClure</b> <sup>1</sup> , Richard J. Smith <sup>1</sup> , Martha S. Cyert <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
107	Predicting the First Steps of Mutation in Randomly Assembled Microbial Communities	<b>John D. McEnany</b> <sup>1</sup> , Benjamin H. Good <sup>2,3,4</sup> Biophysics Program <sup>1</sup> and Departments of Applied Physics <sup>2</sup> and Biology <sup>3</sup> , Stanford University; Chan-Zuckerberg Biohub <sup>4</sup>
108	Examining the Link Between Down Syndrome and Alzheimer's Disease Using Multimodal Biomarkers	<b>Claire McIntyre</b> <sup>1</sup> , Manish Sagar <sup>1</sup> , Hadi Hosseini <sup>1</sup> , Jennifer L. Bruno <sup>1</sup> Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University
109	CRISPR Screens in Assembloids Reveal Neurodevelopmental Disorder Genes Involved in Human Interneuron Development	<b>Xiangling Meng</b> <sup>1,2</sup> , David Yao <sup>3</sup> , Kent Imaizumi <sup>1,2</sup> , Xiaoyu Chen <sup>1,2</sup> , Kevin W. Kelley <sup>1,2</sup> , Noah Reis <sup>1,2</sup> , Mayuri Vijay Thete <sup>1,2</sup> , Arpana Arjun McKinney <sup>4</sup> , Shravanti Kulkarni <sup>1,2</sup> , Georgia Panagiotakos <sup>4,5</sup> , Michael C. Bassik <sup>3</sup> , Sergiu P. Pasca <sup>1,2,*</sup> (*corresponding author) Departments of Psychiatry & Behavioral Sciences <sup>1</sup> and Genetics <sup>3</sup> and Stanford Brain Organogenesis Program <sup>2</sup> , Stanford University; Eli & Edythe Broad Center of Regeneration Medicine & Stem Cell Research <sup>4</sup> and Department of Biochemistry & Biophysics <sup>5</sup> , University of California San Francisco
110	Identifying the Intestine Secretome and Its Role in Lifespan	<b>Jason W. Miklas</b> <sup>1</sup> , Katharina Papsdorf <sup>1</sup> , Nicole R. Haseley <sup>1</sup> , Anne Brunet <sup>1</sup> Department of Genetics <sup>1</sup> , Stanford University
111	Impact of Reading Intervention on the Visual Word Form Area in Struggling Readers	<b>Jamie L. Mitchell</b> <sup>1</sup> , Hannah L. Stone <sup>1</sup> , Maya Yablonski <sup>2</sup> , Jasmine E. Tran <sup>1</sup> , Mia Fuentes-Jimenez <sup>1</sup> , Jason D. Yeatman <sup>1,2,3</sup> Graduate School of Education <sup>1</sup> , Division of Developmental-Behavioral Pediatrics <sup>2</sup> , and Department of Psychology <sup>3</sup> , Stanford University
112	Chemical Basis for Seasonality in the Spread of Airborne Viral Infections	<b>Mohammad Mofidfar</b> <sup>1</sup> , Masoud A. Mehrgardi <sup>1,2</sup> , Richard N. Zare <sup>1</sup> Department of Chemistry <sup>1</sup> , Stanford University; Department of Chemistry <sup>2</sup> , University of Isfahan
113	Tailoring CAR T-Cell Treatments for Diverse Donor Profiles	<b>Lina Mohamad</b> <sup>1</sup> , Alison McClellan <sup>1</sup> , Jonathan Lu <sup>1</sup> , Theodore Roth <sup>1</sup> , Ansuman Satpathy <sup>1</sup> Department of Pathology <sup>1</sup> , Stanford University
114	Modeling Human Embryo Implantation <i>in vitro</i>	<b>Matteo A. Mole</b> <sup>1,2,3</sup> , Molika Sinha <sup>1</sup> , Andrea Palomar <sup>4,5</sup> , Sarah Elderkin <sup>4</sup> , Irene Zorzan <sup>4</sup> , Alexandra Pokhilko <sup>4</sup> , Christopher Penfold <sup>4</sup> , Margherita Y. Turco <sup>6</sup> , Francisco Domínguez <sup>5</sup> , Peter Rugg-Gunn <sup>4</sup> Department of Obstetrics & Gynecology <sup>1</sup> , Dunlevie Maternal-Fetal Medicine Center for Discovery, Innovation & Clinical Impact <sup>2</sup> , and Maternal & Child Health Research Institute (MCHRI) <sup>3</sup> , Stanford University; Epigenetics Programme <sup>4</sup> , Babraham Institute; Instituto de Investigación Sanitaria La Fe <sup>5</sup> ; Friedrich Miescher Institute for Biomedical Research <sup>6</sup>
115	Investigating Sex-Specific Effects of Early Life Stress and Hormonal Influences on Extended Amygdala Neuropeptide Pathways Regulating Alcohol Drinking, Anxiety, and Anhedonia	<b>Allison R. Morningstar</b> <sup>1,2</sup> , Angeline C. Yu <sup>1</sup> , Emmalyn P. Leonard <sup>1,2</sup> , Haniyyah Sardar <sup>1</sup> , R. Nick Fajardo <sup>1</sup> , William J. Giardino <sup>1,3</sup> Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Interdepartmental Neurosciences Graduate Program <sup>2</sup> , and Stanford Bio-X <sup>3</sup> , Stanford University
116	A Robust Cytoskeleton Confers Wound Resilience in <i>Stentor coeruleus</i>	<b>Ambika V. Nadkarni</b> <sup>1,2,*</sup> , Rajorshi Paul <sup>1,*</sup> , Kevin S. Zhang <sup>1</sup> , Wallace F. Marshall <sup>2</sup> , Sindy K.Y. Tang <sup>1</sup> (*equal contribution) Department of Mechanical Engineering <sup>1</sup> , Stanford University; Department of Biochemistry & Biophysics <sup>2</sup> , University of California San Francisco
117	Ultrasound Molecular Imaging of Breast Cancer Using Contrast Enhanced Ultrasound Imaging with Robotic Arm for Automatic Breast Volume Scanning	<b>Abishek Nagarajan Parimala</b> <sup>1</sup> , Jeremy Dahl <sup>2</sup> , Ramasamy Paulmurugan <sup>2</sup> , Arutselvan Natarajan <sup>2</sup> , Dongwoon Hyun <sup>2</sup> , Walter Simson <sup>2</sup>

		Department of Mechanical & Aerospace Engineering <sup>1</sup> , Illinois Institute of Technology; Department of Radiology <sup>2</sup> , Stanford University
118	Developing Power Control, Trigger, and Data Acquisition for MAGIS-100 Distributed Imaging System	<b>Archini (Nemi) Nayak</b> <sup>1</sup> , Sanha Cheong <sup>1,2</sup> , Ariel G. Schwartzman <sup>2</sup> Department of Physics <sup>1</sup> , Stanford University; SLAC National Accelerator Laboratory <sup>2</sup>
119	Detection of Senescent Cells in Using a Novel Gd(III) MR Imaging Agent	<b>Kerem Nernecli</b> <sup>1</sup> , Marek Harris <sup>1</sup> , Tsuyoshi Ueyama <sup>2</sup> , Dilyana Mangarova <sup>1</sup> , Vidya Suriyadevara <sup>1</sup> , Micheal E. Moseley <sup>1</sup> , Laura J. Pisani <sup>1</sup> , Wei Wu <sup>1</sup> , Jian-Hong Tang <sup>3</sup> , Thomas J. Meade <sup>3</sup> , Heike E. Daldrup-Link <sup>1</sup> Departments of Radiology <sup>1</sup> and Cardiothoracic Surgery <sup>2</sup> , Stanford University; Department of Chemistry <sup>3</sup> , Northwestern University
120	Efficient and Multiplexed Tracking of Single Cells Using Whole-Body PET/CT	<b>Hieu T.M. Nguyen</b> <sup>1</sup> , Neeladrisingha Das <sup>1</sup> , Yuting Wang <sup>2</sup> , Charles K.F. Chan <sup>2</sup> , Guillem J. Pratz <sup>1</sup> Departments of Radiation Oncology & Medical Physics <sup>1</sup> and Surgery <sup>2</sup> , Stanford University
121	Characterizing the Functions of SMARCB1 in Translation	<b>Linh Nguyen</b> <sup>1</sup> , Livia Ulicna <sup>1</sup> , Alberto Gatto <sup>1</sup> , Emma Klemperer <sup>1</sup> , Burhan Farooqee <sup>1</sup> , Thomas Saddouk <sup>1</sup> , Capucine van Rechem <sup>1</sup> Department of Pathology <sup>1</sup> , Stanford University
122	Newly Identified Ball and Chain Gating Mechanism of the Neuronal Voltage-Gated Cl <sup>-</sup> Channel	<b>Audrey Nguyen-Hoang</b> <sup>1</sup> , Torben Neelands <sup>1</sup> , Mengyuan Xu <sup>1</sup> , Wah Chiu <sup>2,3</sup> , Merritt Maduke <sup>1</sup> Departments of Molecular & Cellular Physiology <sup>1</sup> , Bioengineering <sup>2</sup> , and Microbiology & Immunology <sup>3</sup> , Stanford University
123	Use of Novel Fluorescent Probes to Detect and Monitor Treatment Response to Early Surgical Site Infections with Multiplexed Short Wave Infrared Imaging	<b>Ki Wan (Roy) Park</b> <sup>1</sup> , Stella Yang <sup>1</sup> , Tulio Valdez <sup>1</sup> Department of Otolaryngology (Head & Neck Surgery) <sup>1</sup> , Stanford University
124	Tauopathy Risk Factor, EIF2AK3 (PERK), Influences Tau Protein Aggregation	<b>Soyeon Park</b> <sup>1</sup> , Goonho Park <sup>1,2</sup> , Angela Galdamez <sup>1,2</sup> , Leon Chea <sup>1,2</sup> , Jian Wu <sup>3</sup> , Soyoun Park <sup>4</sup> , Nobuhiko Hiramatsu <sup>1</sup> , Hyejung Min <sup>1,2</sup> , Jaeseok Han <sup>4</sup> , Jonathan H. Lin <sup>1,2</sup> Department of Pathology <sup>1</sup> , Stanford University; VA Palo Alto Healthcare System <sup>2</sup> ; Department of Pharmacology <sup>3</sup> , University of California San Diego; Soonchunhyang Institute of Medi-bio Science (SIMS) <sup>4</sup> , Soonchunhyang University
125	Colonization Dynamics and Microbial Interactions in the Human Gut Microbiome: Insights from <i>In vitro</i> Communities	<b>Autumn Parrott</b> <sup>1</sup> , Doran Goldman <sup>2</sup> , Rashi Jeeda <sup>3</sup> , Lauryn Franzese <sup>1</sup> , Katherine Xue <sup>2</sup> , Kerwyn Casey Huang <sup>1,4,5</sup> , David Relman <sup>4,6,7</sup> Departments of Bioengineering <sup>1</sup> , Biology <sup>2</sup> , Microbiology & Immunology <sup>4</sup> , and Medicine <sup>6</sup> , Stanford University; California Institute of Technology <sup>3</sup> ; Chan Zuckerberg Biohub <sup>5</sup> ; Veterans Affairs Palo Alto Health Care System <sup>7</sup>
126	Ocular Expressions of Memory: Exploring How Learning Changes Eye Movements	<b>Kristine P. Pashin</b> <sup>1</sup> , Marc B. Harrison <sup>1</sup> , Alice M. Xue <sup>1</sup> , Tammy T. Tran <sup>1,2</sup> , Shawn T. Schwartz <sup>1,3</sup> , Julia E. Rathmann-Bloch <sup>1</sup> , Taylor M. Ruck <sup>1</sup> , Anthony D. Wagner <sup>1,3</sup> Departments of Psychology <sup>1</sup> and Neurology & Neurological Sciences <sup>2</sup> and Wu Tsai Neurosciences Institute <sup>3</sup> , Stanford University
127	Untangling How Cohesin Folds the <i>Drosophila</i> Genome in Post-Mitotic Neurons	<b>Aleena Patel</b> <sup>1</sup> , Kate Scuderi <sup>2</sup> , Alistair Boettiger <sup>1</sup> Department of Developmental Biology <sup>1</sup> , Stanford University; Department of Molecular Biology & Genetics <sup>2</sup> , Cornell University
128	Viscoelastic Characterization of <i>Stentor coeruleus</i> using Microfluidic Aspiration	<b>Rajorshi Paul</b> <sup>1</sup> , Ethan T. Farah <sup>2</sup> , Sindy K.Y. Tang <sup>1</sup> Departments of Mechanical Engineering <sup>1</sup> and Biomechanical Engineering <sup>2</sup> , Stanford University
129	Wearipedia: Democratizing Wearable Technology Through a Holistic Approach	<b>Tristan Peng</b> <sup>1</sup> , Alexander Rosenberg Johansen <sup>1</sup> , Michael Snyder <sup>1</sup> Department of Genetics <sup>1</sup> , Stanford University

130	Drought Tolerance in Natural Populations of <i>Arabidopsis thaliana</i>	<b>Diego Rafael Perez</b> <sup>1</sup> , Ethan Gurwitch <sup>2</sup> , Xing Wu <sup>3</sup> , Maliheh Esfahanian <sup>3</sup> , Moises Exposito-Alonso <sup>1,3,4</sup> Department of Biology <sup>1</sup> , Stanford University; Department of Biology <sup>2</sup> , Duke University; Departments of Plant Biology <sup>3</sup> and Global Ecology <sup>4</sup> , Carnegie Institution for Science
131	Dynamics and Category-Specificity in High-Level Visual Processing: Differences in Response Patterns for Dynamic Body and Scene Stimuli Between Ventral and Lateral Visual Processing Streams	<b>Karla Perez</b> <sup>1</sup> , Danya Ortiz <sup>1</sup> , Beth Rispoli <sup>1</sup> , Kalanit Grill-Spector <sup>1,2</sup> Department of Psychology <sup>1</sup> and Wu Tsai Neurosciences Institute <sup>2</sup> , Stanford University
132	Preparing Visible Light-Cleavable Proteins for Time-Resolved Crystallography	<b>Claudia Phillips</b> <sup>1</sup> , Sapphire Doan <sup>1</sup> , Sandra Mous <sup>2</sup> , Maithri Kashipathy <sup>2</sup> , Guosong Hong <sup>3</sup> , Phillip Kyriakakis <sup>1</sup> Departments of Bioengineering <sup>1</sup> and Materials Science & Engineering <sup>3</sup> , Stanford University; Center for Structural Dynamics in Biology <sup>2</sup> , SLAC National Accelerator Laboratory
133	Cognitive Effects of Pentylentetrazol in a Mouse Model of Down's Syndrome	<b>Rebecca Pizzitola</b> <sup>1</sup> , Grace Ajibola <sup>2</sup> , Angelica Alvarado Carpio <sup>2</sup> , Elsa Pittaras <sup>3</sup> , Craig Heller <sup>4</sup> Departments of Symbolic Systems <sup>1</sup> , Bioengineering <sup>2</sup> , and Biology <sup>3</sup> and School of Medicine <sup>4</sup> , Stanford University
134	Novel Circuit Design for a 3D Position Sensitive Scintillation Detector that Achieves ~100 ps CTR for TOF-PET	<b>Shirin Pourashraf</b> <sup>1</sup> , Zhixiang Zhao <sup>2</sup> , Derek Innes <sup>1</sup> , Andre Gonzalez-Montoro <sup>1</sup> , Joshua W. Cates <sup>3</sup> , Craig S. Levin <sup>1,4,5,6</sup> Departments of Radiology (Molecular Imaging Program) <sup>1</sup> , Bioengineering <sup>4</sup> , Physics <sup>5</sup> , and Electrical Engineering <sup>6</sup> , Stanford University; School of Biomedical Engineering <sup>2</sup> , Shanghai Jiao Tong University; Applied Nuclear Physics Program <sup>3</sup> , Lawrence Berkeley National Laboratory
135	The Regulatory Role of <i>Cxcl12</i> in Coronary Artery Dominance	<b>Pratima Prabala</b> <sup>1,2</sup> , Pam Rios Coronado <sup>2</sup> , Jeffrey Naftaly <sup>2</sup> , Daniela Zanetti <sup>3</sup> , Austin Hilliard <sup>4</sup> , Themistocles Assimes <sup>4</sup> , Kristy Red-Horse <sup>1,2</sup> Howard Hughes Medical Institute <sup>1</sup> , Department of Biology <sup>2</sup> , and School of Medicine <sup>3</sup> , Stanford University; VA Palo Alto Health Care System <sup>4</sup>
136	Active Delivery of Cargo Through 3D-Printed Microfluidic Backed Microneedles	<b>Emily Qian</b> <sup>1</sup> , Ian A. Coates <sup>1</sup> , Madison M. Driskill <sup>1</sup> , Joseph M. DeSimone <sup>1,2</sup> Departments of Chemical Engineering <sup>1</sup> and Radiology <sup>2</sup> , Stanford University
137	Development of a Stretchable, Wireless Sensor for Real-Time Detection and Prevention of Improper Rowing Form to Prevent Lumbar Back Pain	<b>William Qian</b> <sup>1</sup> , QiLiang Chen <sup>2</sup> , Kyun Kyu Kim <sup>1</sup> , Zhenan Bao <sup>1</sup> Departments of Chemical Engineering <sup>1</sup> and Anesthesiology, Perioperative & Pain Medicine <sup>2</sup> , Stanford University
138	Examining the Impact of CBT-I on REM Sleep Latency in Those With Insomnia and Depressive Symptoms	<b>Zimin Qian</b> <sup>1</sup> , Maryam Ahmadi <sup>1</sup> , Raquel Osorno <sup>1</sup> , Natalie Solomon <sup>1</sup> , Rebecca Bernert <sup>1</sup> , Leanne Williams <sup>1</sup> , James Gross <sup>2</sup> , Laura Lazzeroni <sup>1</sup> , Jerome Yesavage <sup>1</sup> , Rachel Manber <sup>1</sup> , Andrea Goldstein-Piekarski <sup>1</sup> Departments of Psychiatry & Behavioral Sciences <sup>1</sup> and Psychology <sup>2</sup> , Stanford University
139	Loss of AZGP1 Promotes Angiogenesis for Prostate Cancer	Ru M. Wen <sup>1</sup> , <b>Zhengyuan Qiu</b> <sup>1</sup> , G. Edward W. Marti <sup>2</sup> , Fernando Jose Garcia Marques <sup>3,4</sup> , Abel Bermudez <sup>3,4</sup> , Jonathan R. Pollack <sup>5</sup> , Hongjuan Zhao <sup>1</sup> , Sharon J. Pitteri <sup>3,4</sup> , James D. Brooks <sup>1,4</sup> Departments of Urology <sup>1</sup> , Molecular & Cellular Physiology <sup>2</sup> , Radiology <sup>3</sup> , and Pathology <sup>5</sup> and Canary Center at Stanford for Cancer Early Detection <sup>4</sup> , Stanford University
140	Characterizing Forebrain Progenitor Chromatin Remodeling during Neural Tube Closure	<b>Arjun Rajan</b> <sup>1</sup> , Ryann Fame <sup>2</sup> Departments of Developmental Biology <sup>1</sup> and Neurosurgery <sup>2</sup> , Stanford University
141	Using Embedded 3D Printing to Optimize a Multi-Material Auxetic Actuator	<b>Caitlin Ramos</b> <sup>1</sup> , Fredrik Samdal Solberg <sup>1</sup> , Jianyi Du <sup>2</sup> , Mark Skylar-Scott <sup>2</sup>

		Departments of Mechanical Engineering <sup>1</sup> and Bioengineering <sup>2</sup> , Stanford University
142	Systems Immunology of Transcriptional Responses to Multiple Viruses Identifies Conserved Antiviral Pathway Dynamics in Macaques and Humans	<b>Kalani Ratnasiri</b> <sup>1,2</sup> , Hong Zheng <sup>4,5</sup> , Jiaying Toh <sup>1,3,4,5</sup> , Zhiyuan Yao <sup>6</sup> , Veronica Duran <sup>6</sup> , Michele Donato <sup>3,4</sup> , Mario Roederer <sup>7</sup> , Megha Kamath <sup>7</sup> , John-Paul M. Todd <sup>7</sup> , Matthew Gagne <sup>7</sup> , Kathryn E. Foulds <sup>7</sup> , Joseph R. Francica <sup>7</sup> , Kizzmekia S. Corbett <sup>7</sup> , Daniel C. Douek <sup>7</sup> , Robert A. Seder <sup>7</sup> , Shirir Einav <sup>6,8,9</sup> , Catherine A. Blish <sup>1,8,9,10*</sup> , Purvesh Khatri <sup>3,4,5*</sup> (*corresponding authors) Stanford Immunology Program <sup>1</sup> , Departments of Epidemiology & Population Health <sup>2</sup> , Surgery (Division of Abdominal Transplantation) <sup>3</sup> , Microbiology & Immunology <sup>6</sup> , and Medicine <sup>8</sup> , Center for Biomedical Informatics Research <sup>4</sup> , Institute for Immunity, Transplantation & Infection <sup>5</sup> , and Medical Scientist Training Program <sup>10</sup> , Stanford University; Vaccine Research Center, National Institute of Allergy & Infectious Diseases <sup>7</sup> , National Institutes of Health; Chan Zuckerberg Biohub <sup>9</sup>
143	MDMA Enhances Empathy-Like Behaviors in Mice through Serotonin Release in Nucleus Accumbens	Ben Rein <sup>1</sup> , <b>Kendall Raymond</b> <sup>1</sup> , Sabrena Tuy <sup>2</sup> , Cali Boustani <sup>2</sup> , Boris Heifets <sup>3</sup> , Monique Smith <sup>2</sup> , Rob Malenka <sup>1</sup> Departments of Psychiatry & Behavioral Sciences (Nancy Pritzker Laboratory) <sup>1</sup> and Anesthesiology, Perioperative & Pain Medicine <sup>3</sup> , Stanford University; Department of Neurobiology <sup>2</sup> , University of California San Diego
144	Sensing and Actuation with a Chip Inside a Living Cell: Extremely Small Bioelectronic Interfaces	<b>Jihun Rho</b> <sup>1</sup> , Ulises Diaz <sup>2</sup> , George Alexopoulos <sup>1</sup> , H.-S. Philip Wong <sup>1</sup> , Wallace Marshall <sup>2</sup> , Ada S. Y. Poon <sup>1</sup> Department of Electrical Engineering <sup>1</sup> , Stanford University; Department of Biochemistry & Biophysics <sup>2</sup> , University of California San Francisco
145	Differential Expression of <i>GRAIL</i> Isoforms in Regulatory and Effector T Cells of Mice and Human	<b>Miko Rimer</b> <sup>1</sup> , <b>Jacqueline Woo</b> <sup>1</sup> , Fangyuan Wang <sup>1</sup> , Linda Yip <sup>1</sup> , C. Garrison Fathman <sup>1</sup> Department of Medicine <sup>1</sup> , Stanford University
146	Comparison of Capillaries at Different Pressures	<b>Gabriela Rincon</b> <sup>1</sup> , Marcus Forst <sup>2</sup> , David Cornfield <sup>3</sup> , Stephen Quake <sup>2,4</sup> Departments of Physics <sup>1</sup> , Applied Physics <sup>2</sup> , and Bioengineering <sup>4</sup> , Stanford University; Pediatrics-Pulmonary Medicine <sup>3</sup> , Stanford Lucile Packard Children's Hospital
147	Optimizing Material Composition for Embedded 3D Bioprinting of Perfusable Networks	<b>Ricardo Rios</b> <sup>1</sup> , Betty Cai <sup>1</sup> , Ashal Ali <sup>1</sup> , Sarah Heilshorn <sup>1</sup> Department of Materials Science & Engineering <sup>1</sup> , Stanford University
148	Towards a Behavioral Metric of Frustration	<b>Ariana Rodrigues</b> <sup>1</sup> , Hugo Martin <sup>1</sup> , Zoe Zhang <sup>1</sup> , Neir Eshel <sup>1</sup> Department of Psychiatry & Behavioral Sciences (STAAR Lab) <sup>1</sup> , Stanford University
149	A Hole Lot of Fun: Microfluidic Stamping Reveals Donut Cell Mysteries	<b>Ramon Rodriguez</b> <sup>1</sup> , Kevin S. Zhang <sup>2</sup> , Grace Jiang <sup>2</sup> , Daniel Knapp <sup>3</sup> , Emma Harms <sup>3</sup> , Alvie Kam <sup>3</sup> , Sophia Huang <sup>3</sup> , Wallace F. Marshall <sup>4</sup> , Sindy K.Y. Tang <sup>2</sup> Departments of Biology <sup>1</sup> and Mechanical Engineering <sup>2</sup> , Stanford University; Department of Biology <sup>3</sup> , San Francisco State University; Department of Biochemistry & Biophysics <sup>4</sup> , University of California San Francisco
150	How do Specific Neurons Become Part of a Memory? Characterizing Engram Allocation in the Mouse Hippocampus	<b>Julián Rodríguez Cárdenas</b> <sup>1</sup> , Omid Miry <sup>2,3</sup> , Lu Chen <sup>2,3</sup> School of Humanities & Sciences <sup>1</sup> and Departments of Neurosurgery <sup>2</sup> and Psychiatry & Behavioral Sciences <sup>3</sup> , Stanford University
151	Theoretical Calculation and Experimental Demonstration of Differential Heating for Conductive Nanoparticles in Lossy Biological Media Under Radio Frequency Irradiation	<b>Nicholas J. Rommelfanger</b> <sup>1,4,5</sup> , Kenneth Brinson Jr. <sup>2,4</sup> , Zihao Ou <sup>2,4</sup> , John E. Bailey <sup>2,3,4</sup> , Analiese M. Bancroft <sup>2,4</sup> , Carl H.C. Keck <sup>2,4</sup> , Guosong Hong <sup>2,4</sup> Departments of Applied Physics <sup>1</sup> , Materials Science & Engineering <sup>2</sup> , and Electrical Engineering <sup>3</sup> , Wu Tsai

		Neurosciences Institute <sup>4</sup> , and Stanford Bio-X <sup>5</sup> , Stanford University
152	Uncovering Structure Across Cell Biology using a Foundation Model for Single-Cell Gene Expression	Yanay Rosen <sup>1</sup> , <b>Yusuf Roohani</b> <sup>2</sup> , Stephen Quake <sup>3</sup> , Jure Leskovec <sup>1</sup> Departments of Computer Science <sup>1</sup> , Biomedical Data Science <sup>2</sup> , and Bioengineering <sup>3</sup> , Stanford University
153	MicroRNAs-182 and 338 Preserve Oxidative Phosphorylation During Substrate Limitation in Both Male and Female Primary Astrocyte Cultures	<b>Isabella Russo</b> <sup>1,2</sup> , Xiaoyun Sun <sup>1</sup> , Elizabeth Manis <sup>1</sup> , Cassidy Robbins <sup>1</sup> , Nathanael Smith <sup>1</sup> , Claire Ai Ju Dean <sup>1</sup> , Lillen Montague-Alamin <sup>1</sup> , Creed Stary <sup>1</sup> Department of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> and Stanford Bio-X Undergraduate Summer Research Program <sup>2</sup> , Stanford University
154	Metabolite-Mediated Longevity Effects of Host Microbiome Composition	<b>Amin Sajjadian</b> <sup>1</sup> , Jason Millington <sup>1,2</sup> , Lucy O'Brien <sup>2,4,5</sup> , Kerwyn Casey Huang <sup>1,3,5</sup> Departments of Bioengineering <sup>1</sup> , Molecular & Cellular Physiology <sup>2</sup> , and Microbiology & Immunology <sup>3</sup> and Institute of Stem Cell Biology & Regenerative Medicine <sup>4</sup> , Stanford University; Chan Zuckerberg Biohub <sup>5</sup>
155	Injectable Self-Assembled Hydrogel Platform Enhances Influenza Vaccine Efficacy	<b>Olivia Saouaf</b> <sup>1</sup> , Eric Appel <sup>1</sup> Department of Materials Science & Engineering <sup>1</sup> , Stanford University
156	Physical Remodeling of Basement Membrane and Stromal Collagen During Collective Invasion	Julie Chang <sup>1*</sup> , <b>Aashrith Saraswathibhatla</b> <sup>2*</sup> , Zhaoqiang Song <sup>3,4</sup> , Sushama Varma <sup>5</sup> , Colline Sanchez <sup>6,7</sup> , Naomi Hassan Kahtan Alyafei <sup>1</sup> , Dhiraj Indana <sup>2</sup> , Raleigh Slyman <sup>2</sup> , Sucheta Srivastava <sup>5</sup> , Katherine Liu <sup>8</sup> , Michael C. Bassik <sup>8</sup> , M. Peter Marinkovich <sup>9,10</sup> , Louis Hodgson <sup>6,7</sup> , Vivek Shenoy <sup>3,4</sup> , Robert B. West <sup>5</sup> , Ovijit Chaudhuri <sup>2,11</sup> (*equal contribution) Departments of Bioengineering <sup>1</sup> , Mechanical Engineering <sup>2</sup> , Pathology <sup>5</sup> , Genetics <sup>8</sup> , and Dermatology <sup>9</sup> and Sarafan ChEM-H <sup>11</sup> , Stanford University; Center for Engineering Mechanobiology <sup>3</sup> and Department of Materials Science & Engineering <sup>4</sup> , University of Pennsylvania; Department of Molecular Pharmacology <sup>6</sup> and Gruss-Lipper Biophotonics Center <sup>7</sup> , Albert Einstein College of Medicine; Dermatology Service <sup>10</sup> , VA Medical Center
157	rTMS vs. Accelerated TMS vs. NMDA Antagonists: Meta-Analysis for Treating Comorbid Obsessive-Compulsive Disorders	<b>Arshia Sazi</b> <sup>1</sup> , Catherine Daye <sup>2</sup> , Cammie Rolle <sup>3</sup> , Flint Espil <sup>3</sup> , Nolan Williams <sup>3</sup> Department of Psychiatry <sup>2</sup> and School of Medicine University <sup>3</sup> , Stanford University <sup>1</sup>
158	Self-Supervised Learning of Representations for Space Generates Multi-Modular Grid Cells	<b>Rylan Schaeffer</b> <sup>1</sup> , Mikail Khona <sup>2,3</sup> , Tzuhsuan Ma <sup>4</sup> , Cristóbal Eyzaguirre <sup>1</sup> , Sanmi Koyejo <sup>1</sup> , Ila Rani Fiete <sup>2</sup> Department of Computer Science <sup>1</sup> , Stanford University; Departments of Brain & Cognitive Sciences <sup>2</sup> and Physics <sup>3</sup> , Massachusetts Institute of Technology; Howard Hughes Medical Institute Janelia Research Campus <sup>4</sup>
159	NIR-II Gut Imaging	<b>Elizabeth Lea Schmidt</b> <sup>1</sup> , Su Zhao <sup>1</sup> , Adarsh Tantry <sup>2</sup> , Carl Hienrich Christian Keck <sup>1</sup> , Zihao Ou <sup>1</sup> , Julia Kaltschmidt <sup>2</sup> , Guosong Hong <sup>1</sup> Departments of Materials Science & Engineering <sup>1</sup> and Neurosurgery <sup>2</sup> , Stanford University
160	Combined Near Infrared Photoacoustic Imaging and Ultrasound Detects Vulnerable Atherosclerotic Plaque	<b>Martin Karl Schneider</b> <sup>1,2,3*</sup> , James Wang <sup>1,2,3*</sup> , Aris Kare <sup>1,2,3</sup> , Shaunak S. Adkar <sup>4</sup> , Darren Salmi <sup>5</sup> , Caitlin F. Bell <sup>4</sup> , Tom Alsaigh <sup>4</sup> , Dhananjay Wagh <sup>6</sup> , John Collier <sup>6</sup> , Aaron Mayer <sup>7</sup> , Sarah J. Snyder <sup>3,8</sup> , Alexander D. Borowsky <sup>9</sup> , Steven R. Long <sup>10</sup> , Maarten G. Lansberg <sup>11</sup> , Gary K. Steinberg <sup>11</sup> , Jeremy J. Heit <sup>3,8</sup> , Nicholas J. Leeper <sup>4</sup> , Katherine W. Ferrara <sup>1,2,3</sup> (*equal contribution) Molecular Imaging Program at Stanford <sup>1</sup> , Stanford Bio-X <sup>2</sup> , Sequencing Group Stanford Genomics <sup>6</sup> , and Departments of Radiology <sup>3</sup> , Surgery (Division of Vascular Surgery) <sup>4</sup> , Pathology <sup>5</sup> , Neurosurgery <sup>8</sup> , and Neurology & Neurological

		Sciences <sup>11</sup> , Stanford University; Enable Medicine <sup>7</sup> ; Department of Pathology & Laboratory Medicine <sup>9</sup> , University of California Davis School of Medicine; Department of Pathology <sup>10</sup> , University of California San Francisco
161	Discovery and Functional Validation of Genes Associated with Muscular Fitness and Cardiometabolic Traits	<b>Theresa M. Schnurr</b> <sup>1,2,3</sup> , Christopher Jin <sup>1,2</sup> , Ewa Bielczyk-Maczynska <sup>1,2</sup> , Miranda Johnson <sup>1,2</sup> , Michael J. Gloudeans <sup>4,5</sup> , James Jahng <sup>2</sup> , Ivan Carcamo-Orive <sup>1,2</sup> , Torben Hansen <sup>3</sup> , Euan A. Ashley <sup>1,2</sup> , Joshua W. Knowles <sup>1,2</sup> Departments of Medicine (Division of Cardiovascular Medicine) <sup>1</sup> and Pathology <sup>5</sup> , Stanford Cardiovascular Institute <sup>2</sup> , and Biomedical Informatics Training Program <sup>4</sup> , Stanford University; Novo Nordisk Foundation Center for Basic Metabolic Research <sup>3</sup> , University of Copenhagen
162	Catalyzing Immunotherapy Breakthroughs: Advancing Nano-Conjugates to Penetrate the Blood-Brain Barrier in Treating Resistant Melanoma Brain Metastases	<b>Saurabh Sharma</b> <sup>1</sup> , Mamatha Serasembati <sup>1</sup> , M. Usman Ahmad <sup>1</sup> , David Lee <sup>1,2</sup> , Alison B. Warner <sup>1</sup> , Amanda R. Kirane <sup>1</sup> Department of General Surgery <sup>1</sup> , Stanford University; School of Medicine <sup>2</sup> , Loma Linda University
163	Microfluidic Loading of Neutrophils and NETosis Assay Analysis	<b>Shay Nair Sharma</b> <sup>1</sup> , Neelanjan Akuli <sup>1</sup> , Regina Sanchez Flores <sup>1</sup> , Hawa Racine Thiam <sup>1</sup> Department of Bioengineering <sup>1</sup> , Stanford University
164	The Role of Anakinra, an IL-1 Inhibitor, in sJIA/DRESS Presentation	<b>Surbhi Sharma</b> <sup>1</sup> , Wei Jiang <sup>1</sup> , Venkata Vamsee Aditya Mallajosyula <sup>1</sup> , Xiaodan Liu <sup>1</sup> , Vivian E. Saper <sup>1</sup> , Mark M. Davis <sup>1</sup> , Robert Busch <sup>2</sup> , Elizabeth D. Mellins <sup>1</sup> Department of Pediatrics (Human Gene Therapy Program) <sup>1</sup> , Stanford University; Department of Life Sciences <sup>2</sup> , University of Roehampton, Whitelands College
165	Repetitive Transcranial Magnetic Stimulation Modulates Brain Connectivity in Children with Self-Limited Epilepsy with Centrottemporal Spikes	<b>Xiwei She</b> <sup>1</sup> , Kerry C. Nix <sup>1</sup> , Wendy Qi <sup>1</sup> , Miguel Menchaca <sup>1</sup> , Christopher C. Cline <sup>2</sup> , Wei Wu <sup>2</sup> , Zihuai He <sup>1</sup> , Fiona M. Baumer <sup>1</sup> Departments of Neurology <sup>1</sup> and Psychiatry & Behavioral Sciences <sup>2</sup> , Stanford University
166	Nonlinear Dynamic Changes During Human Aging Revealed in Multi-omics Profiles	<b>Xiaotao Shen</b> <sup>1,2†</sup> , Chuchu Wang <sup>3†</sup> , Xin Zhou <sup>1,2</sup> , Wenyu Zhou <sup>1,2</sup> , Daniel Hornburg <sup>1,2</sup> , Si Wu <sup>1,2</sup> , Michael P. Snyder <sup>1,2*</sup> (†co-first authors, *corresponding author) Department of Genetics <sup>1</sup> , Stanford Center for Genomics & Personalized Medicine <sup>2</sup> , and Howard Hughes Medical Institute <sup>3</sup> , Stanford University
167	<i>In situ</i> Opto-Mechanical Force Sensors Based on Upconverting Nanoparticles for Cartilage Monitoring	<b>Cindy Shi</b> <sup>1</sup> , Jason Casar <sup>1</sup> , Mia Cano <sup>2</sup> , Beatriz Robinson <sup>3</sup> , Julia Kaltschmidt <sup>4</sup> , Jennifer Dionne <sup>1</sup> Departments of Materials Science <sup>1</sup> , Engineering Physics <sup>2</sup> , Neuroscience <sup>3</sup> , and Neurosurgery <sup>4</sup> , Stanford University
168	Alternative Nascent mRNA Processing Specifies Changes in Protein Isoforms Expressed in an Adult Stem Cell Lineage	<b>Ishaan Singh</b> <sup>1</sup> , Eric Wong <sup>1</sup> , Neuz Matias <sup>1</sup> , Minx Fuller <sup>1</sup> Department of Developmental Biology <sup>1</sup> , Stanford University
169	Immuno-DESI-MSI Spatially Locates a Drug Target, Signaling Factors, and Enzymes on Tissue	<b>Xiaowei Song</b> <sup>1</sup> , Richard N. Zare <sup>1</sup> Department of Chemistry <sup>1</sup> , Stanford University
170	Benchtop Heart Model to Test New Catheter Designs for Catheter Ablation Procedures	<b>Grace Soontornviwath</b> <sup>1</sup> , Meg Babakhanian <sup>1</sup> , Robert Wilkerson <sup>2</sup> , Paul J. Wang <sup>1</sup> Departments of Bioengineering <sup>1</sup> , Cardiovascular Medicine <sup>1</sup> , and Radiology <sup>2</sup> , Stanford University
171	Blood Sequestration and Circulatory Physiology of Northern Glass Frogs ( <i>Hyalinobatrachium fleischmanni</i> )	<b>Daniel W. Sorensen</b> <sup>1,2</sup> , Lauren O'Connell <sup>1</sup> , Kristy Red-Horse <sup>1,2</sup> Department of Biology <sup>1</sup> , Stanford University; Howard Hughes Medical Institute <sup>2</sup>
172	Novel Blindness-Deafness Syndrome in People Lacking ATF6 Function	<b>Korina Steinbergs</b> <sup>1,2</sup> , Eun-Jin Lee <sup>1,2,3</sup> , Kyle Kim <sup>1,3</sup> , Monica Sophia Diaz-Aguilar <sup>1,2,3,4</sup> , Hyejung Min <sup>2,3</sup> , Eduardo Chavez <sup>5,6</sup> , Lance A. Safarta <sup>1,2</sup> , Guirong Zhang <sup>1,3</sup> , Allen F. Ryan <sup>5,6</sup> , Jonathan H. Lin <sup>1,2,3</sup> Departments of Pathology <sup>1</sup> and Ophthalmology <sup>2</sup> , Stanford University; VA Palo Alto Healthcare System <sup>3</sup> ; Rush

		University Medical College <sup>4</sup> ; Departments of Surgery <sup>5</sup> and Neuroscience <sup>6</sup> , University of California San Diego and Veterans Administration Medical Center
173	Cell Receptor Monitoring using Biocompatible Lanthanide Nanoparticles	<b>Ariel Stiber</b> <sup>1</sup> , Jason Casar <sup>1</sup> , Chris Siefe <sup>1</sup> , Karan Kathuria <sup>2</sup> , Mark Davis <sup>2</sup> , Jennifer Dionne <sup>1</sup> Departments of Materials Science & Engineering <sup>1</sup> and Microbiology & Immunology <sup>2</sup> , Stanford University
174	Plasticity of Frontal Language Regions in Struggling Readers Following Intervention	<b>Hannah L. Stone</b> <sup>1</sup> , Maya Yablonski <sup>2</sup> , Jamie L. Mitchell <sup>1</sup> , Mia Fuentes-Jimenez <sup>1</sup> , Jasmine E. Tran <sup>1</sup> , Jason D. Yeatman <sup>1,2,3</sup> Graduate School of Education <sup>1</sup> and Departments of Pediatrics <sup>2</sup> and Psychology <sup>3</sup> , Stanford University
175	Tuning Macroporous Scaffold Composition Enhanced Cranial Bone Regeneration through Modulating Stem Cell-Macrophage Crosstalk	<b>Ni Su</b> <sup>1</sup> , Cassandra Villicana <sup>2</sup> , Heena Saqib <sup>2</sup> , Peyton Freeman <sup>2</sup> , Xinming Tong <sup>1</sup> , Fan Yang <sup>1,2</sup> Departments of Orthopaedic Surgery <sup>1</sup> and Bioengineering <sup>2</sup> , Stanford University
176	A Damage-Sensing, Self-Healing Electronic Skin for Surgical Simulation Training	<b>Eric Sun</b> <sup>1</sup> , Gracie Ngaruka <sup>1</sup> , Samuel E. Root <sup>1</sup> , Zhenan Bao <sup>1</sup> Department of Chemical Engineering <sup>1</sup> , Stanford University
177	Rectal Administration of Tacrolimus Protects against Post-ERCP Pancreatitis in Mice	Yu-Chu Lin <sup>1*</sup> , Jianbo Ni <sup>1*</sup> , <b>Gayathri Swaminathan</b> <sup>1</sup> , Asna Khalid <sup>1</sup> , Monique T. Barakat <sup>1,2</sup> , Adam Frymoyer <sup>3</sup> , <b>Cheng-Yu Tsai</b> <sup>1</sup> , Mang Yu <sup>1</sup> , Sohail Z. Husain <sup>1</sup> (*co-first authors) Departments of Pediatrics (Divisions of Gastroenterology, Hepatology, & Nutrition <sup>1</sup> and Neonatology <sup>3</sup> ) and Medicine (Division of Gastroenterology & Hepatology) <sup>2</sup> , Stanford University
178	Interrogating the Phenotype and Function of Human CD19 CAR $\gamma\delta$ T cell Therapy	Zhenyu Dai <sup>1</sup> , <b>Isabella Szabo</b> <sup>1</sup> , Nadia Kaveh <sup>1</sup> , Melody Smith <sup>1</sup> Department of Medicine (Division of Blood & Marrow Transplantation) <sup>1</sup> , Stanford University
179	Tuning Mineral Cues Modulates Breast Cancer-Bone Metastasis in a Spatially Patterned 3D Model	<b>Michelle Tai</b> <sup>1</sup> , Vedant Chittake <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
180	Combinatorial Treatment of BMP2 and VEGF Inhibitor Promote Articular Cartilage Regeneration by Skeletal Stem Cell	<b>Eri Takematsu</b> <sup>1</sup> , Matthew Murphy <sup>1</sup> , Yuting Wang <sup>1</sup> , Liming Zhao <sup>1</sup> , Charles K.F. Chan <sup>1</sup> Department of Surgery <sup>1</sup> , Stanford University
181	CCL6 Deletion Activates TGF $\beta$ 1 Signaling and Upregulates CCL9 and CCL5 Expression in Macrophages	<b>Supreeti Tallapragada</b> <sup>1</sup> , Justine Chan <sup>1</sup> , Venkatesh Krishnan <sup>1</sup> , Hong Zeng <sup>2</sup> , Oliver Dorigo <sup>1</sup> Department of Obstetrics & Gynecology <sup>1</sup> and Stanford Core Facility of Transgenic, Knockout & Tumor Model Center (TLTC) <sup>2</sup> , Stanford University
182	Cartography of Genomic Interactions Enables Deep Analysis of Single-Cell Expression Data	<b>Md Tauhidul Islam</b> <sup>1</sup> , Lei Xing <sup>1</sup> Department of Radiation Oncology <sup>1</sup> , Stanford University
183	Context Dependent Effect of Optogenetically Evoked Dopamine Release	<b>Anjali Temal</b> <sup>1</sup> , Gavin Touponse <sup>1</sup> , Zoe Zhang <sup>1</sup> , Matthew Pomrenze <sup>1</sup> , Jason Tucciarone <sup>1</sup> , Neir Eshel <sup>1</sup> Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University
184	3D Quantitative Amplified Magnetic Resonance Imaging (3D q-aMRI)	<b>Itamar Terem</b> <sup>1</sup> , Nan Wang <sup>1</sup> , Paul Condron <sup>2</sup> , Kyan Younes <sup>3</sup> , Javid Abderezaei <sup>4</sup> , Eryn Kwon <sup>2,8,5</sup> , Haribalan Kumar <sup>2,5,6</sup> , Hillary Vossler <sup>3</sup> , Mehmet Kurt <sup>4</sup> , Elizabeth Mormino <sup>3</sup> , Luis de Lecea <sup>7</sup> , Samantha Holdsworth <sup>2,8</sup> , Kawin Setsompop <sup>9</sup> Departments of Electrical Engineering <sup>1</sup> , Neurology & Neurological Sciences <sup>3</sup> , Psychiatry & Behavioral Sciences <sup>7</sup> , and Radiology <sup>9</sup> , Stanford University; Mātai Medical Research Institute <sup>2</sup> , Tairāwhiti-Gisborne; Department of Mechanical Engineering <sup>4</sup> , University of Washington; Auckland Bioengineering Institute <sup>5</sup> and Faculty of Medical & Health Science & Centre for Brain Research <sup>8</sup> , University of Auckland; General Electric Healthcare <sup>6</sup>

185	Heat Causes of Muscle Fatigue and Failure: Changes in D- and L-Lactate Levels in Response to Hyperthermia During Physical Exercise	<b>J. Thomas</b> <sup>1</sup> , Vinh Cao <sup>2</sup> , Geoffrey Abrams <sup>1</sup> , H. Craig Heller <sup>2</sup> School of Medicine <sup>1</sup> and Department of Biology <sup>2</sup> , Stanford University
186	Tsc22d4 is a Glucose-Binding Protein Involved in Adipogenesis	<b>Vivian Tien</b> <sup>1</sup> , Ian Ferguson <sup>2</sup> , Lindsey Meservey <sup>2</sup> , Weili Miao <sup>2</sup> , Vanessa Lopez-Pajares <sup>2</sup> , Paul Khavari <sup>2,3,4</sup> Department of Bioengineering <sup>1</sup> and Programs in Epithelial Biology <sup>2</sup> and Cancer Biology <sup>3</sup> , Stanford University; VA Palo Alto Healthcare System <sup>4</sup>
187	Developing Tools to Study the Interplay between Age, Stress, and the N-Glycome	<b>George Tilton-Low</b> <sup>1</sup> , Michael Schoof <sup>2,3</sup> , Carolyn R. Bertozzi <sup>2,4</sup> , Tony Wyss-Coray <sup>3,5</sup> Departments of Bioengineering <sup>1</sup> , Chemistry <sup>2</sup> , and Neurology & Neurological Sciences <sup>3</sup> , Sarafan ChEM-H <sup>4</sup> , and Wu Tsai Neurosciences Institute <sup>5</sup> , Stanford University
188	Childhood Friends: Understanding the Impact of Serpentine Soils on Young and Mature Oak Mycorrhizal Communities	<b>Esther Tok</b> <sup>1</sup> , Kabir Peay <sup>1,2</sup> Department of Biology <sup>1</sup> and Woods Institute for the Environment <sup>2</sup> , Stanford University
189	Design and 3D-Printing of Microneedle Testing Applicators for Efficient Drug Delivery	<b>Nolan W. Tok</b> <sup>1</sup> , Ian A. Coates <sup>1</sup> , Joseph M. DeSimone <sup>1,2</sup> Departments of Chemical Engineering <sup>1</sup> and Radiology <sup>2</sup> , Stanford University
190	Uncovering the Mechanisms of Collateral Coronary Artery Development in the Guinea Pig	<b>Emily Trimm</b> <sup>1,4</sup> , Brian Raftrey <sup>2</sup> , Xiaochen Fan <sup>3,4</sup> , Pamela Rios Coronado <sup>3,4</sup> , Jamie Bozeman <sup>4</sup> , Kristy Red-Horse <sup>3,4,5</sup> School of Medicine <sup>1</sup> , Department of Biology <sup>3</sup> , and Stanford Cardiovascular Institute <sup>4</sup> , Stanford University; Department of Stem Cell & Regenerative Biology <sup>2</sup> , Harvard University; Howard Hughes Medical Institute <sup>5</sup>
191	A NanoCurvS Platform for Quantitative and Multiplex Analysis of Curvature-Sensing Proteins	Chih-Hao Lu <sup>1†</sup> , <b>Ching-Ting Tsai</b> <sup>1†</sup> , Taylor Jones IV <sup>1</sup> , Vincent Chim <sup>1</sup> , Lasse H. Klausen <sup>1,2</sup> , Wei Zhang <sup>1</sup> , Xiao Li <sup>1,3</sup> , Zeinab Jahed <sup>1,4*</sup> , Bianxiao Cui <sup>1,5,6,7*</sup> (†equal contribution, *corresponding authors) Department of Chemistry <sup>1</sup> , Wu Tsai Neuroscience Institute <sup>5</sup> , Sarafan ChEM-H <sup>6</sup> , and Stanford Bio-X <sup>7</sup> , Stanford University; Interdisciplinary Nanoscience Center (INANO) <sup>2</sup> , Aarhus University; School of Mechanical Engineering <sup>3</sup> , Xi'an Jiaotong University; Department of Nanoengineering <sup>4</sup> , University of California San Diego
192	Elucidating Meiotic Recombination and Crossover Interference using Polymer Physics Modelling	<b>Ariana Tse</b> <sup>1</sup> , Trent A. C. Newman <sup>2</sup> , Bruno Beltran <sup>3</sup> , Sean M. Burgess <sup>2</sup> , Andrew J. Spakowitz <sup>1,3,4</sup> Departments of Materials Science & Engineering <sup>1</sup> and Chemical Engineering <sup>4</sup> and Biophysics Program <sup>3</sup> , Stanford University; Department of Molecular & Cellular Biology <sup>2</sup> , University of California Davis
193	Impact of a Daily Morning Huddle on Safety in Perioperative Services	<b>Hubert Tuyishime</b> <sup>1,2</sup> , Rebecca Claire <sup>1,3</sup> , Karthik Balakrishnan <sup>1,4</sup> , Heidi Chan <sup>1</sup> , Linda Lam <sup>1</sup> , Matt Randolph <sup>1</sup> , Jean Stroud <sup>1</sup> , Kevin Traber <sup>1</sup> , Kevin Shea <sup>1,2</sup> Lucile Packard Children's Hospital <sup>1</sup> and Departments of Orthopaedic Surgery <sup>2</sup> , Anesthesiology, Perioperative & Pain Medicine <sup>3</sup> , and Otolaryngology (Head & Neck Surgery) <sup>4</sup> , Stanford University
194	Intraspecific Thermal Performance of Treehole Mosquito Parasite <i>Lambornella clarki</i>	<b>Gowri Vadmal</b> <sup>1</sup> , Johannah Farner <sup>1</sup> , Erin Mordecai <sup>1</sup> Department of Biology <sup>1</sup> , Stanford University
195	5-HT2c but not 5-HT1b Receptors in the NAc Constrain the Rewarding Effects of MDMA	Matthew B. Pomrenze <sup>2</sup> , <b>Sam Vaillancourt</b> <sup>1</sup> , Juliana S. Salgado <sup>1</sup> , Pierre Llorach <sup>1</sup> , Zahra Rastegar <sup>1</sup> , Grecia Ramirez Ovalle <sup>1</sup> , Austen B. Casey <sup>1</sup> , Daniel Ryskamp <sup>1</sup> , Robert C. Malenka <sup>2</sup> , Boris D. Heifets <sup>1</sup> Departments of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> and Psychiatry & Behavioral Sciences (Nancy Pritzker Laboratory) <sup>2</sup> , Stanford University
196	Engineering Next-Generation Breast Cancer Cell Therapies: Targeting HER2 Heterogeneity	<b>Gloria Vergara Neyra</b> <sup>1</sup> , Rogelio Hernandez-Lopez <sup>1,2,3,4</sup> Departments of Bioengineering <sup>1</sup> and Genetics <sup>2</sup> and Stanford Cancer Institute <sup>3</sup> , Stanford University; Chan-Zuckerberg Biohub <sup>4</sup>



197	Molecular Control of Scarring: Enhancing Surgical Repair Healing in Pediatric Patients	<b>Ishita Verma</b> <sup>1</sup> , Melody Ly <sup>1</sup> , Fabiana Aellos <sup>1</sup> , Mackenzie Hoy <sup>1</sup> , Tom Quach <sup>1</sup> , Jill Helms <sup>1</sup> Department of Plastic & Reconstructive Surgery <sup>1</sup> , Stanford University
198	Engineering Bone ECM-Derived Microribbon Scaffolds for Immunomodulation and Bone Regeneration	<b>Cassandra Villicana</b> <sup>1</sup> , Ni Su <sup>2</sup> , Andrew Yang <sup>1</sup> , Fan Yang <sup>1,2</sup> Departments of Bioengineering <sup>1</sup> and Orthopaedic Surgery <sup>2</sup> , Stanford University
199	Branching Morphogenesis of Sea Cucumber Ossicles in Multi-Cellular Syncytial Confinement	<b>Pranav Vyas</b> <sup>1</sup> , Charlotte Brannon <sup>2</sup> , Laurent Formery <sup>2</sup> , Christopher Lowe <sup>2</sup> , Manu Prakash <sup>1</sup> Departments of Bioengineering <sup>1</sup> and Biology <sup>2</sup> , Stanford University
200	Model of Euchromatin Clustering Resulting from Local Reader Protein Interactions	<b>Joseph Wakim</b> <sup>1</sup> , Andrew J. Spakowitz <sup>1,2</sup> Departments of Chemical Engineering <sup>1</sup> and Materials Science & Engineering <sup>2</sup> , Stanford University
201	Optimizing Portable Neuroimaging Techniques in Clinical Settings with Humans in Motion	<b>Eli Wandless</b> <sup>1</sup> , Noor Hassan <sup>1</sup> , Suanna Moron <sup>2</sup> , Yuanyuan Gao <sup>2</sup> , Allan Reiss <sup>2</sup> , Cassondra Eng <sup>2</sup> Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University
202	A Direct-Print Technology for Highly Customizable Neural Interfaces with Cellular Resolution	<b>Pingyu Wang</b> <sup>1</sup> , Eric G. Wu <sup>2</sup> , Hasan Ullusan <sup>3</sup> , A.J. Phillips <sup>2</sup> , Madeline Rose Hays <sup>4</sup> , Alexandra Kling <sup>5</sup> , Eric Tianjiao Zhao <sup>6</sup> , Sasidhar Madugula <sup>7</sup> , Ramandeep Vilku <sup>2</sup> , Praful Krishna Vasireddy <sup>2</sup> , Andreas Hierlemann <sup>3</sup> , Guosong Hong <sup>1</sup> , E.J. Chichilnisky <sup>5,8</sup> , Nicholas A. Melosh <sup>1*</sup> (*corresponding author) Departments of Materials Science & Engineering <sup>1</sup> , Electrical Engineering <sup>2</sup> , Bioengineering <sup>4</sup> , Neurosurgery <sup>5</sup> , and Chemical Engineering <sup>6</sup> , School of Medicine <sup>7</sup> , and Hansen Experimental Physics Laboratory <sup>8</sup> , Stanford University; Department of Biosystems Science & Engineering <sup>3</sup> , Basel ETH Zürich
203	Simulating Arbitrary Dose Levels and Independent Noise Image Pairs from a Single CT Scan	<b>Sen Wang</b> <sup>1</sup> , Adam Wang <sup>1,2</sup> Departments of Radiology <sup>1</sup> and Electrical Engineering <sup>2</sup> , Stanford University
204	Organism-Wide, Cell-Type-Specific Secretome Mapping of Exercise Training in Mice	<b>Wei Wei</b> <sup>1,2,3</sup> , Nicholas M. Riley <sup>3,4,5</sup> , Xuchao Lyu <sup>1,3,6</sup> , Carolyn R. Bertozzi <sup>3,4,5</sup> , Jonathan Z. Long <sup>1,3,6,7</sup> Departments of Pathology <sup>1</sup> , Biology <sup>2</sup> , and Chemistry <sup>4</sup> , Sarafan ChEM-H <sup>3</sup> , Howard Hughes Medical Institute <sup>5</sup> , Stanford Diabetes Research Center <sup>6</sup> , and Wu Tsai Human Performance Alliance <sup>7</sup> , Stanford University
205	Targeting Siglec-7/9 Glyco-immune Checkpoints Promotes Immune Cell-Mediated Suppression of Prostate Cancer	<b>Ru M. Wen</b> <sup>1</sup> , Jessica C. Stark <sup>2</sup> , G. Edward W. Marti <sup>3</sup> , Nick Riley <sup>2</sup> , Hongjuan Zhao <sup>1</sup> , Carolyn R. Bertozzi <sup>2</sup> , Sharon J. Pitteri <sup>4</sup> , James D. Brooks <sup>1</sup> Departments of Urology <sup>1</sup> , Chemistry <sup>2</sup> , Molecular & Cellular Physiology <sup>3</sup> , and Radiology <sup>4</sup> , Stanford University
206	Probing Hippocampal Plasticity Mechanisms During Spatial Navigation of Novel Environments	<b>Celestine Wenardy</b> <sup>1</sup> , Linlin Z. Fan <sup>1</sup> , Karl Deisseroth <sup>1,2</sup> Departments of Bioengineering <sup>1</sup> and Psychiatry & Behavioral Sciences <sup>2</sup> , Stanford University
207	Using Human Pluripotent Stem Cell Differentiation to Discover Novel Blood Vessel Progenitors	<b>June Winters</b> <sup>1</sup> , Daniel W. Sorensen <sup>1,4</sup> , Sherry Li Zheng <sup>2,3</sup> , Lay Teng Ang <sup>2</sup> , Kyle M. Loh <sup>2,3</sup> , Kristy Red-Horse <sup>1,4</sup> Howard Hughes Medical Institute <sup>1</sup> , Stanford Institute for Stem Cell Biology & Regenerative Medicine <sup>2</sup> , and Departments of Developmental Biology <sup>3</sup> and Biology <sup>4</sup> , Stanford University
208	Bacteriophage-Nanoparticle Conjugates for Therapeutic and Diagnostic Applications	<b>Katherine E. Woo</b> <sup>1,2</sup> , Maryam Hajfathalian <sup>1,2</sup> , Paul Bollyky <sup>1,2</sup> Departments of Medicine (Infectious Diseases) <sup>1</sup> and Microbiology & Immunology <sup>2</sup> , Stanford University
209	Utilization of 3D Statistical Shape Modeling of Anatomic Variation Across a Cohort of Patellar Instability Patients	<b>Christian Wright</b> <sup>1</sup> , Marissa Lee <sup>2</sup> , Anthony Gatti <sup>3</sup> , Matthew Veerkamp <sup>4</sup> , Akshay Chaudhari <sup>3</sup> , Scott Delp <sup>2</sup> , Shital Parikh <sup>4</sup> , J. Lee Pace <sup>5</sup> , Seth L. Sherman <sup>6</sup> , Kevin Shea <sup>6</sup> , the JUPITER Study Group

		Departments of Biology <sup>1</sup> , Mechanical Engineering <sup>2</sup> , Radiology <sup>3</sup> , and Orthopaedic Surgery <sup>6</sup> , Stanford University; Division of Orthopaedic Surgery <sup>4</sup> , Cincinnati Children's Hospital Medical Center; Orthopedic Surgery <sup>5</sup> , Children's Health Andrews Institute for Orthopaedics & Sports Medicine
210	Light-Orchestrated Micro-Droplet Reactor for Solid Phase Chemistry	<b>Mo Wu</b> <sup>1</sup> , Mohammad Asif Zaman <sup>1</sup> , Wei Ren <sup>1</sup> , Michael A. Jensen <sup>2</sup> , Ronald W. Davis <sup>2</sup> , Lambertus Hesselink <sup>1</sup> Departments of Electrical Engineering <sup>1</sup> and Biochemistry <sup>2</sup> , Stanford University
211	Magnetic Milli-Spinner for Robotic Interventional Surgery	<b>Shuai Wu</b> <sup>1</sup> , Yilong Chang <sup>1</sup> , Qi Li <sup>1</sup> , Renee Zhao <sup>1</sup> Department of Mechanical Engineering <sup>1</sup> , Stanford University
212	Dynamics of Real-World Glucose Response After Eating	<b>Yue Wu</b> <sup>1</sup> , Ben W. Ehlert <sup>1</sup> , Dalia Perelman <sup>1,2</sup> , Ahmed A. Metwally <sup>1,3</sup> , Heyjun Park <sup>1</sup> , Alessandra Celli <sup>1</sup> , Caroline Bejikian <sup>1</sup> , Tracey McLaughlin <sup>1,2</sup> , Michael P. Snyder <sup>1</sup> Departments of Genetics <sup>1</sup> and Medicine <sup>2</sup> , Stanford University; Google <sup>3</sup>
213	Ultrasound Imaging of Immune Cells in the Tumor Microenvironment Using a Novel FN3-CD3 Linked Contrast-Enhanced Microbubbles	<b>Charles Wynter</b> <sup>1</sup> , Kaavya Narayan <sup>1</sup> , Adya Gupta <sup>1</sup> , Clyde John <sup>1</sup> , Jeremy Dahl <sup>1</sup> , Paulmurugan Ramasamy <sup>1</sup> , Arutselvan Natarajan <sup>1</sup> Department of Radiology <sup>1</sup> , Stanford University
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217	Plasma Membrane Curvature Promotes ER-PM Contact Formation Mediated by Junctophilin	<b>Yang Yang</b> <sup>1</sup> , Luis Valencia <sup>1</sup> , Chih-Hao Lu <sup>1</sup> , Ching-Ting Tsai <sup>1</sup> , Chun Liu <sup>2,3,4</sup> , Joseph Wu <sup>2,3,4</sup> , Bianxiao Cui <sup>1,5</sup> Departments of Chemistry <sup>1</sup> , Medicine <sup>2</sup> , and Radiology <sup>3</sup> , Stanford Cardiovascular Institute <sup>4</sup> , and Wu Tsai Neurosciences Institute <sup>5</sup> , Stanford University
218	Comparison of Energy Bin Compression Strategies for Photon Counting Detectors	<b>Yirong Yang</b> <sup>1,2</sup> , Sen Wang <sup>2</sup> , Norbert J. Pelc <sup>2</sup> , Debashish Pal <sup>3</sup> , Adam S. Wang <sup>1,2</sup> Departments of Electrical Engineering <sup>1</sup> and Radiology <sup>2</sup> , Stanford University; GE Healthcare <sup>3</sup>
219	Inhibition of the CCL5-CCR Axis Reduces Myeloid Bias in Aged Hematopoietic Stem Cells	<b>Leyla Yilmaz</b> <sup>1</sup> , Allison Banuelos <sup>1</sup> , Nardin Georgeos <sup>1</sup> , Michelle Baez <sup>1</sup> , Rahul Sinha <sup>1</sup> , Irving L. Weissman <sup>1</sup> Department of Stem Cell Biology & Regenerative Medicine <sup>1</sup> , Stanford University
220	Chemistry, Formation and Passivation of Solid-Electrolyte Interphase (SEI) at Li-Metal Potential	<b>Weilai Yu</b> <sup>1</sup> , Yi Cui <sup>2</sup> , Zhenan Bao <sup>1</sup> Departments of Chemical Engineering <sup>1</sup> and Materials Science & Engineering <sup>2</sup> , Stanford University
221	E-Liquid Aerosol without Nicotine Worsens Pulmonary Endothelial and Vascular Dysfunction for Rodents with the Inactivating ALDH2*2 Variant	<b>Xuan Yu</b> <sup>1</sup> , Barbara Hung <sup>1</sup> , Aldrin Montana <sup>2</sup> , Samuel Chen <sup>2</sup> , Eric R. Gross <sup>1</sup> Department of Anesthesiology, Perioperative & Pain Medicine <sup>1</sup> , Stanford University; Department of Computer Science & Engineering <sup>2</sup> , University of California Santa Cruz
222	Predictors of Medial Temporal Tau in Preclinical AD	<b>Jafar Zamani</b> <sup>1</sup> , Amirali Vahid <sup>1</sup> , Hadi Hosseini <sup>1</sup> Department of Psychiatry & Behavioral Sciences <sup>1</sup> , Stanford University
223	Sifting Through the Mud: Developing a Neuropathic Pain Screen Tool Among Youth with Multiple Diagnoses	<b>Jaime Zamores Carrasco</b> <sup>1</sup> , Emma Francesca Gaydos <sup>1</sup> , Courtney W. Hess <sup>1</sup> , Giulia Mesaroli <sup>2</sup> , Jennifer Stinson <sup>2</sup> , Laura Simons <sup>1</sup>

		Department of Anesthesiology, Perioperative, & Pain Medicine <sup>1</sup> , Stanford University; SickKids Children's Hospital <sup>2</sup>
224	Brain Strain Estimation with Unsupervised Domain Adaptation	<b>Xianghao Zhan</b> <sup>1</sup> , Jiawei Sun <sup>1</sup> , Yuzhe Liu <sup>1</sup> , Nicholas J. Cecchi <sup>1</sup> , Enora Le Flao <sup>1</sup> , Olivier Gevaert <sup>2</sup> , Michael Zeineh <sup>3</sup> , David Camarillo <sup>1</sup> Departments of Bioengineering <sup>1</sup> , Biomedical Data Science <sup>2</sup> and Radiology <sup>3</sup> , Stanford University
225	Investigating Cell Division Mechanisms and Cell-Size Noise and Homeostasis with the <i>E. coli</i> Whole-Cell Model	<b>Albert Zhang</b> <sup>1</sup> , Gwanggyu Sun <sup>1</sup> , Markus Covert <sup>1</sup> Department of Bioengineering <sup>1</sup> , Stanford University
226	Mechanically-Driven Closure of Extreme Membrane Wounds in a Single Cell	<b>Kevin S. Zhang</b> <sup>1</sup> , Ambika V. Nadkarni <sup>1,2</sup> , Martín Koch <sup>3</sup> , Wallace F. 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; Department of Microbiology <sup>3</sup> , University of California Santa Barbara
227	Thermotaxis in an Apolar, Non-Neuronal Animal	<b>Grace Zhong</b> <sup>1</sup> , Laurel Kroo <sup>2</sup> , Manu Prakash <sup>1,3</sup> Departments of Bioengineering <sup>1</sup> and Mechanical Engineering <sup>2</sup> and Woods Institute for the Environment <sup>3</sup> , Stanford University
228	Impact of Cerebrospinal Fluid K <sup>+</sup> on Embryonic Cortical Development	<b>Blake Zhou</b> <sup>1</sup> , Ryann Fame <sup>1,2</sup> Neurosciences PhD Program <sup>1</sup> and Department of Neurosurgery <sup>2</sup> , Stanford University
229	Characterizing Head Impact Exposure in Collegiate Wrestlers Using Instrumented Mouthguard Technology	<b>Claudia Zimmerman</b> <sup>1</sup> , Enora LeFlao <sup>1</sup> , David Camarillo <sup>1</sup> Department of Bioengineering <sup>1</sup> , Stanford University