PROGRAM

MONDAY, October 15—7:00 PM

Welcome Remarks

SESSION 1 KEYNOTE SESSION

Introductions by: **Yi Zuo,** University of California Santa Cruz, USA

Karel Svoboda [35'+10']
HHMI Janelia Research Campus

Advances for tracking neural dynamics *in vivo*—A view from Janelia

Yang Dan [35'+10']
University of California, Berkeley

Neural circuits controlling sleep 1

TUESDAY, October 16—9:00 AM

SESSION 2 IMAGING SYNAPTIC STRUCTURE AND FUNCTION

Chairperson: **Yulong Li,** Peking University, Beijing, China

Experience-dependent synapse reorganization in the living brain
Yi Zuo [20'+10']
Presenter affiliation: University of California, Santa Cruz, California. 2

Mapping functional synapse development in vivo
Christian Lohmann [20'+10']
Presenter affiliation: Netherlands Institute for Neuroscience, Amsterdam, the Netherlands. 3

Dendritic spine imaging reveals synaptic basis of orientation selectivity in layer 4 of mouse visual cortex
Arthur Konnerth [20'+10']
Presenter affiliation: Technical University of Munich, Munich, Germany. 4

Coffee / Tea Break

Learning and sleep-dependent dendritic spine plasticity and maintenance
Wenbiao Gan [20'+10']
Presenter affiliation: New York University School of Medicine, New York, New York. 5

Exercise training improves motor skill learning via selective activation of mTOR
Kai Chen, Yuhan Zheng, Ji-an Wei, Chaoran Ren, Kwok-Fai So, Li Zhang [10'+5']
Presenter affiliation: Jinan University, Guangzhou, China. 6

Cortex-wide synaptic AMPA receptor plasticity during motor learning
Richard H. Roth, Robert H. Cudmore, Han L. Tan, Yong Zhang, Richard L. Huganir [10'+5']
Presenter affiliation: Johns Hopkins University School of Medicine, Baltimore, Maryland. 7

***In vivo* modeling of human neuron dynamics and Down syndrome**
Vincenzo De Paola [10'+5']
Presenter affiliation: Imperial College London, London, United Kingdom. 8

POSTER BLITZ
See poster session for abstract listing

SESSION 3 POSTER SESSION

Selective activation of parvalbumin interneurons prevents stress-induced synapse loss and perceptual defects
Chia-Chien E. Chen, Ju Lu, Renzhi Yang, Jun B. Ding, Yi Zuo
Presenter affiliation: University of California, Santa Cruz, Santa Cruz, California. 9

A family of genetically-encoded fluorescent sensors for monitoring monoamines, nucleotides, lipids and peptides
Liting Dong, Huan Wang, Kaikai He, Yulong Li
Presenter affiliation: Peking University School of Life Sciences, Beijing, China. 10

Two-photon calcium imaging of neuronal activity in motor cortex of mice during dexterous movement
Jihong Zheng, Jian-Zhong Guo, Britton Sauerbrei, Adam Hantman
Presenter affiliation: Howard Hughes Medical Institute, Ashburn, Virginia. 11

Spatiotemporal dynamics of ASIC1a underlies excitatory synaptic function
Xing-Lei Song, Di-Shi Liu, Min Qiang, Qin Hu, Tian-Le Xu
Presenter affiliation: Shanghai Jiaotong University School of Medicine, Shanghai, China. 12

Hessian structured illumination microscopy
Junchao Fan, Liuju Li, Xiaoshuai Huang, Shan Tan, Liangyi Chen
Presenter affiliation: Peking University, Beijing, China. 13

Monitoring tau-tubulin interaction in a living cell using bimolecular fluorescence complementation technique
Seulgi Shin, Sungsu Lim, Hyeanjeong Jeong, Li Ting Kwan, Yun Kyung Kim
Presenter affiliation: Korea Institute of Science and Technology (KIST), Seoul, South Korea; Korea University, Seoul, South Korea. 14

Cortical landscape of head-to-body angle modulation in mice cortex
Minseok Kang, Young-Geun Choe, Hyunwoo Yang, Yong Jeong
Presenter affiliation: KAIST, Daejeon, South Korea. 15

Whole-brain analysis of the NMDA receptor antagonist-induced neuronal activation in mice using high-speed and high-resolution imaging system FAST (block-*face* serial microscopy *to*mography)
Kaoru Seiriki, Atsushi Kasai, Takanobu Nakazawa, Hitoshi Hashimoto
Presenter affiliation: Osaka University, Osaka, Japan. 16

Quantitative imaging protein and nascent RNA interactions by FLIM-FRET
De-en Sun, Xing Chen
Presenter affiliation: Peking University, Beijing, China. 17

Visualizing the function of hydroxyl radicals *via* SIRT1 in brains of mice with stress-induced depression related behaviours
Xin Wang, Ping Li, Chuanchen Wu, Qi Ding, Wen Zhang, Bo Tang
Presenter affiliation: Shandong Normal University, Jinan, China. 18

Excitation wavelength optimization improves photostability of ASAP-family GEVIs
Fang Xu, Dong-Qing Shi, Pak-Ming Lau, Michael Z. Lin, Guo-Qiang Bi
Presenter affiliation: University of Science and Technology of China, Hefei, Anhui, China; Hefei National Laboratory for Physical Sciences at the Microscale, Hefei, Anhui, China. 19

High-throughput, extensible whole brain mapping framework for VISoR
Chao-Yu Yang, Hao Wang, Lufeng Ding, Guo-Qiang Bi
Presenter affiliation: University of Science and Technology of China, Hefei, China. 20

Visual contrast modulates operant learning responses in larval zebrafish
Wenbin Yang, Yutong Meng, Danyang Li, Quan Wen
Presenter affiliation: University of Science and Technology of China, Hefei, China. 21

Improving FLIM-FRET and BRET reporting with new red fluorescent proteins
Chuqiu Zhang, Jun Chu
Presenter affiliation: Chinese Academy of sciences, Shenzhen, China. 22

TUESDAY, October 16—4:30 PM

Chinese Tea and Beer Tasting

SESSION 4 IMAGING NEURONAL ACTIVITY AND NETWORK

Chairperson: **Yi Zuo,** University of California Santa Cruz, USA

The high-gain state of visual cortex—How does it gate plasticity?
Michael P. Stryker, Megumi Kaneko, Yujiao J. Sun [20'+10']
Presenter affiliation: University of California, San Francisco, California. 23

Volitional control of cortical neuromodulation
David Kleinfeld, Conrad Foo, Adrian F. Lozada, Paul Paul Slesinger [20'+10']
Presenter affiliation: University of California at San Diego, La Jolla, California. 24

Neuronal cell-subtype specificity of neural synchronization in mouse primary visual cortex
Ulf Knoblich, Lawrence Huang, Hongkui Zeng, Lu Li [10'+5']
Presenter affiliation: Sun Yat-sen University, Guangzhou, China. 25

Emergence of sequence ensembles of striatal D1 and D2 neurons with distinct temporal patterns during motor learning
Di Lu, Meng-jun Sheng, Zhiming Shen, Mu-ming Poo [10'+5']
Presenter affiliation: Institute of Neuroscience, Shanghai, China; University of Chinese Academy of Sciences, Beijing, China. 26

Coffee / Tea Break

The role of OFC to auditory cortex projections in flexible auditory decision task
Yanhe Liu, Jingwei Pan, Ninglong Xu [10'+5']
Presenter affiliation: Institute of Neuroscience, State Key Laboratory of Neuroscience,Shanghai Institutes for Biological Sciences, Shanghai, China; University of Chinese Academy of Sciences, Shanghai, China. 27

Posterior parietal cortex is responsible for categorical decision-making on novel sensory stimuli
Lin Zhong, Yuan Zhang, Chuny A. Duan, Jingwei Pan, Ninglong Xu [10'+5']
Presenter affiliation: Institute of Neuroscience, Shanghai, China; University of Chinese Academy of Sciences, Shanghai, China. 28

Functional diversity of new spines formed during a forelimb-specific reaching task
Ju Lu, Shaorong Ma, Yi Zuo [10'+5']
Presenter affiliation: University of California Santa Cruz, Santa Cruz, California. 29

Stereotypy and flexibility of *Caenorhabdtis elegans* escape response
Yuan Wang, Xiaoqian Zhang, Qi Xin, Yu Xie, Mark Alkema, Mei Zhen, Quan Wen [10'+5']
Presenter affiliation: University of Science and Technology of China, Hefei, China. 30

WEDNESDAY, October 17—9:00 AM

SESSION 5 NOVEL INDICATORS FOR BRAIN IMAGING

Chairperson: **Euiseok Kim,** The Salk Institute for Biological Studies, La Jolla, California, USA

Biochemical signal transduction in single dendritic spines
Ryohei Yasuda [20'+10']
Presenter affiliation: Max Planck Florida Institute for Neuroscience, Jupiter, Florida. 31

Random-access multi-photon imaging of an improved voltage indicator reveals electrical activity in deeply located neurons in the awake brain
Michael Lin, Stéphane Dieudonné, Jun Ding, Guoqiang Bi, Donqging Shi, Renzhi Yang, Jonathan Bradley, Benjamin Matthieu, Stephen Evans, Lagnajeet Pradhan, Ivan Dimov, Mariya Chavarha [20'+10']
Presenter affiliation: Stanford University, Stanford, California. 32

Multiplex imaging of neural activity and signaling dynamics
Haruhiko Bito [20'+10']
Presenter affiliation: University of Tokyo Graduate School of Medicine, Tokyo, Japan. 33

Coffee / Tea Break

Spying on dopamine modulation by constructing new genetically-encoded indicators
Yulong Li [20'+10']
Presenter affiliation: Peking University, Beijing, China. 34

Improved calcium sensor GCaMP-X overcomes the side-effects of calmodulin-based GCaMP
Xiaodong Liu, Yaxiong Yang, Yunming Gao [10'+5']
Presenter affiliation: Beihang University, Beijing, China. 35

Hybrid indicators for fast and sensitive voltage imaging
Yongxian Xu, Luxin Peng, Sicong Wang Wang, Anqi Wang Wang, Ruirui Ma Ma, Ying Zhou Zhou, Jiahe Yang, De-en Sun, Wei Lin, Xing Chen, Peng Zou [10'+5']
Presenter affiliation: Peking University, Beijing, China; Tsinghua University, Beijing, China. 36

PARIS, an optogenetic method to map gap junctions
Ling Wu, Ao Dong, Liting Dong, Yulong Li [10'+5']
Presenter affiliation: Peking University School of Life Sciences, Beijing, China. 37

A cellular mechanism of amyloid β-induced neuronal hyperactivity
Benedikt Zott, Manuel Simon, Jana Hartmann, Felix Unger, Bert Sakmann, Arthur Konnerth [10'+5']
Presenter affiliation: Technical University of Munich, Munich, Germany; Cluster for Systems Neurology, Munich, Germany. 38

WEDNESDAY, October 17—2:00 PM

Visit to Old Suzhou

FREE EVENING

THURSDAY, October 18—9:00 AM

SESSION 6 LARGE SCALE IMAGING OF STRUCTURE AND FUNCTION

Chairperson: **Hao Wang,** University of Science and Technology of China, Hefei, China

Wide-field imaging of neural activity at cellular and subcellular resolutions
Masanori Matsuzaki [20'+10']
Presenter affiliation: The University of Tokyo, Tokyo, Japan. 39

Quantitative synapse analysis for cell-type specific connectomics
Dika A. Kuljis, Khaled Zemoura, Cheryl A. Telmer, Jiseok Lee, Eunsol Park, Daniel S. Ackerman, Weifeng Xu, Simon C. Watkins, Don B. Arnold, Marcel P. Bruchez, Alison L. Barth [20'+10']
Presenter affiliation: Carnegie Mellon University, Pittsburgh, Pennsylvania. 40

Brain-wide positioning system (BPS)—A whole brain surveying and mapping system for cell typing based on anatomical and spatial omics information
Qingming Luo [20'+10']
Presenter affiliation: Huazhong University of Science and Technology, Wuhan, China; HUST-Suzhou Institute for Brainsmatics, Suzhou, China. 41

High-speed and high-resolution whole-brain imaging system FAST (block-face serial microscopy tomography)
Hitoshi Hashimoto, Kaoru Seiriki, Atsushi Kasai, Takanobu Nakazawa [20'+10']
Presenter affiliation: Osaka University, Osaka, Japan. 42

Coffee / Tea Break

High-throughput electrophysiological, behavioral, or social event triggered imaging of mouse mesoscale brain activity
Timothy H. Murphy [20'+10']
Presenter affiliation: University of British Columbia, Vancouver, Canada. 43

Multiscale imaging of neuronal synapses and circuits
Guoqiang Bi [20'+10']
Presenter affiliation: University of Science and Technology of China, Hefei, China. 44

Development and application of multi-scale calcium imaging in the primate visual cortical network
Teppei Matsui, Takayuki Hashimoto, Masato Uemura, Tomonari Murakami, Kohei Kikuta, Toshiki Kato, Kenichi Ohki [10'+5']
Presenter affiliation: University of Tokyo, Tokyo, Japan. 45

Video-rate, giga-pixel imaging of biological dynamics at centimeter scale and micron resolution
Jingtao Fan, Jinli Suo, Jiamin Wu, Hao Xie, Lingjie Kong, Zhenrong Zheng, Qionghai Dai [10'+5']
Presenter affiliation: Tsinghua University, Beijing, China. 46

SESSION 7 IMAGING TECHNIQUES

Chairperson: **Ju Lu,** University of California-Santa Cruz, Santa Cruz, California, USA

High spatiotemporal resolution fluorescence imaging of biological samples in vivo
Liangyi Chen [20'+10']
Presenter affiliation: Peking University, Beijing, China. 47

In vivo brain imaging with multiphoton microscopy
Chris Xu [20'+10']
Presenter affiliation: Cornell University, Ithaca, New York. 48

High-precision behavioral neuroscience—Combined two-photon imaging and cell-attached recording in the auditory cortex of behaving mice
Meng Wang, Ruijie Li, Xiang Liao, Shanshan Liang, Jianxiong Zhang, Mengke Yang, Zhenqiao Zhou, Jing Lyu, Jingcheng Li, Xingyi Li, Kuan Zhang, Junan Yan, Shaoqun Zeng, Zsuzsanna Varga, Arthur Konnerth, Israel Nelken, Hongbo Jia, Xiaowei Chen [10'+5']
Presenter affiliation: Third Millitary Medical University, Chongqing, China; Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences, Suzhou, China; Technical University Munich, Munich, Germany. 49

VISoR—A scalable volumetric imaging method for ultrahigh-speed brain mapping at synaptic resolution
Hao Wang, Qingyuan Zhu, Chaoyu Yang, Lufeng Ding, Yan Shen, Fang Xu, Chang Shu, Yujie Guo, Zhiwei Xiong, Qinghong Shan, Fan Jia, Peng Su, Qian-Ru Yang, Jiang-Ning Zhou, Fuqiang Xu, Hua Han, Pak-Ming Lau, Guo-Qiang Bi [10'+5']
Presenter affiliation: University of Science and Technology of China, Hefei, China. 50

Coffee / Tea Break

Super-resolution microscopy for neuroscience—New methods and applications
U. Valentin Nägerl [20'+10']
Presenter affiliation: University of Bordeaux / CNRS, Bordeaux, France. 51

Dynamic control of synaptic nanostructure and function by adhesion molecules
Thomas A. Blanpied [20'+10']
Presenter affiliation: University of Maryland School of Medicine, Baltimore, Maryland. 52

The Janelia Mouselight Project—Cellular diversity and circuit-level connectivity in the mouse brain revealed by large-scale single-neuron reconstructions
Johan Winnubst, Erhan Bas, Tiago Ferreira, Joshua T. Dudman, Charles R. Gerfen, Adam W. Hantman, Wyatt Korff, Sean Murphy, Nelson Spruston, Scott M. Sternson, Karel Svoboda, Jayaram V. Chandrashekar [20'+10']
Presenter affiliation: Janelia Research Campus, Ashburn, Virginia. 53

THURSDAY, October 18—6:00 PM

COCKTAILS and BANQUET

FRIDAY, October 19—9:00 AM

SESSION 8 IMAGING CIRCUITS AND GLIA

Chairperson: **Guoqiang Bi,** University of Science and Technology of China, Hefei, China

Neurotropic virus-based tracers for neurocircuits
Fuqiang Xu [20'+10']
Presenter affiliation: Wuhan Institute of Physics and Mathmatics, the Chinese Academy of Sciences, Wuhan, China; Center of Excellence for Brain Science & Intelligent Technology, the Chinese Academy of Sciences, Shanghai, China. 54

Fine-scale connectivity and genomic features of long-distance cortico-cortical neurons in mouse visual cortex
Euiseok J. Kim, Zhuzhu Zhang, Tony Ito-Cole, Matthew W. Jacobs, Jingtian Zhou, Rosa Castanon, Joseph R. Nery, Mo Hu, Manching Ku, Ling Huang, Danielle Le, Joseph R. Ecker, Edward M. Callaway [10'+5']
Presenter affiliation: The Salk Institute for Biological Studies, La Jolla, California. 55

Anterograde monosynaptic transneuronal tracers derived from herpes simplex virus 1 strain H129
Wen-Bo Zeng, Hai-Fei Jiang, Yi-Ge Song, Xiao Dong, Fei Zhao, Min-Hua Luo [10'+5']
Presenter affiliation: Wuhan Institute of Virology, Chinese Academy of Sciences, Wuhan, China. 56

Astrocyte calcium signaling regulates striatal microcircuits in vivo
Baljit S. Khakh [20'+10']
Presenter affiliation: UCLA, Los Angeles, California. 57

Rapid astrocyte calcium signals
Bruno Weber, Kim Ferrari, Jillian Stobart [20'+10']
Presenter affiliation: Unversity of Zurich, Zurich, Switzerland. 58

Immunosignal amplification and single-cell labeling
Rui Lin, Ruiyu Wang, Qiru Feng, Jing Yuan, Hui Gong, Minmin Luo [20'+10']
Presenter affiliation: National Institute of Biological Sciences (NIBS), Beijing, China; Tsinghua University, Beijing, China; Chinese Institute for Brain Research (CIBR), Beijing, China. 59