

NOVEL INSIGHTS INTO GLIA FUNCTION & DYSFUNCTION

Awaji, Japan

Monday, April 24– Friday, April 28, 2023

Monday	7:00 pm – 8:00 pm	Welcome Remarks and Keynote Lecture
Monday	8:00 pm – 10:00 pm	<i>Dinner & Sake Barrel Breaking</i>
Tuesday	9:30 am – 12:30 pm	1 Oligodendrocyte, NG2
Tuesday	2:00 pm – 5:00 pm	2 Astrocyte
Tuesday	7:00 pm – 9:30 pm	Poster Session
Tuesday	9:30 pm – 10:30 pm	<i>Social Hour</i>
Wednesday	9:30 am – 12:00 pm	3 Microglia
Wednesday	1:30 pm – 6:00 pm	<i>Excursion to Hemeji Castle</i>
Wednesday	7:00 pm – 9:30 pm	4 Glia and Neurological Disease I
Thursday	9:30 am – 11:45 am	5 Glia and Neurological Disease II
Thursday	2:00 pm – 5:15 pm	6 Short Talks
Friday		Departure

Awaji Yumebutai Conference Center

Meeting venue: Main Hall

Poster session: Lobby in 1st Basement of Conference Center

CSHA office: Room 202

*Breakfast**: Cocolare, 2nd floor of Grand Nikko Awaji

Lunch (April 25-27): Event Hall, 1st Basement of Conference Center

Dinner (April 24-26): Event Hall, 1st Basement of Conference Center

Cocktails (April 27): Cielo, 1st floor of Grand Nikko Awaji

Banquet (April 27): Stella, 1st floor of Grand Nikko Awaji

***Only available for guests staying at Grand Nikko Awaji**

Abstracts are the responsibility of the author(s) and publication of an abstract does not imply endorsement by Cold Spring Harbor Asia of the studies reported in the abstract.

These abstracts should not be cited in bibliographies. Material herein should be treated as personal communications and should be cited as such only with the consent of the author.

Please note that ANY photography or video/audio recording of oral presentations or individual posters is strictly prohibited except with the advance permission of the author(s), the organizers, and Cold Spring Harbor Asia.

PROGRAM

MONDAY, April 24—7:00 PM

Welcome Remarks

CSH-Asia

Shumin Duan
Zhejiang University

Bruce Ransom
University of Washington and Chinese University of Hong Kong

KEYNOTE LECTURE

Visualizing metabolic recruitment in brain tissue

L. Felipe Barros [35'+10']

Presenter affiliation: Centro de Estudios Científicos-CECs, Valdivia,
Chile; Universidad San Sebastián, Valdivia, Chile.

1

Dinner and Sake Barrel Breaking

TUESDAY, April 25—9:30 AM

SESSION 1 OLIGODENDROCYTE, NG2

Chairperson: **Shumin Duan**, Zhejiang University, Hangzhou, China

**Lysophosphatidic acid (LPA) signaling as a modulator of
oligodendrocyte differentiation**

Babette Fuss [20'+10']

Presenter affiliation: Virginia Commonwealth University, Richmond,
Virginia.

2

Increasing oligodendrocyte plasticity to promote repair

Gianluigi Nocera, Adrien Vaquié, Santiago Luis Cañón Duque, Johannes Miedema, Cansu Bagin, Azadeh Sharifi-Aghili, Katharina Hegner, Doris Vollmer, Seung-Ryeol Lee, Noo Li Jeon, Sofía Raigón López, Claire Jacob [20'+10']

Presenter affiliation: Johannes Gutenberg University Mainz, Mainz, Germany; University of Fribourg, Fribourg, Switzerland.

3

Molecular regulation of the timing of oligodendrocyte differentiation

Mengsheng Qiu [20'+10']

Presenter affiliation: Hangzhou Normal University, Hangzhou, China.

4

Break

Oligodendrocyte dynamics and its control in learning and memory

Stuart G. Nayar, Takahiro Shimizu, Matthew Swire, Yi Jiang, Matthew Grist, Heidi Johansen-Berg, David Bannerman, Katsutoshi Ogasawara, Koujiro Tohyama, William D. Richardson [20'+10']

Presenter affiliation: University College London, London, United Kingdom.

5

Kir4.1 channel in brain diseases and its clinical implications

Xiaoping Tong [20'+10']

Presenter affiliation: Shanghai Jiao Tong University School of Medicine, Shanghai, China.

6

TUESDAY, April 25—2:00 PM

SESSION 2 ASTROCYTE

Chairpersons: **Bruce Ransom**, University of Washington, Seattle, USA / Chinese University of Hong Kong
Eiji Shigetomi, University of Yamanashi, Chuo, Japan

Astrocytes and network remodeling

Schuichi Koizumi [20'+10']

Presenter affiliation: University of Yamanashi, Yamanashi, Japan.

7

Optical signal detection of local brain environmental changes in epilepsy and sleep

Ko Matsui [20'+10']

Presenter affiliation: Tohoku University, Sendai, Japan.

8

Stress evokes mental disorder-like behaviors via astrocytic MERTK-dependent synapse phagocytosis

Youkyeong G. Byun, Nam-Shik Kim, Gyuri Kim, Yi-Seon Jeon, Jong Bin Choi, Chan-Woo Park, Hyunsoo Jang, Jinkyong Kim, Eunjoon Kim, Yong-Mahn Han, Ki-Jun Yoon, Seung-Hee Lee, Won-Suk Chung [20'+10']

Presenter affiliation: KAIST, Daejeon, South Korea; Institute for Basic Science, Daejeon, South Korea.

9

Break

Astrocytes in brain diseases—Role in synapse dysfunction and cognitive impairment

Elly M. Ho [20'+10']

Presenter affiliation: Brain Center, University Medical Center Utrecht, Utrecht, Netherlands.

10

Astrocyte cell volume dynamics across cortical states and transitions

Fengfei Ding, Saiyue Deng, Peter A. Bork, Natalie L. Hauglund, Maiken Nedergaard, Wei Wang [10'+5']

Presenter affiliation: Huazhong University of Science and Technology, Wuhan, China; University of Rochester, Rochester, New York; Fudan University, Shanghai, China.

11

Adenosine-independent regulation of the sleep-wake cycle by astrocyte activity

Wanling Peng, Xiaotong Liu, Guofen Ma, Zhaofa Wu, Ziyue Wang, Xiang Fei, Meiling Qin, Lizhao Wang, Yulong Li, Siyu Zhang, Min Xu [10'+5']

Presenter affiliation: CAS Center for Excellence in Brain Science and Intelligence Technology, Shanghai, China.

12

Abstractive encoding of brain injury information by astrocytes through frequency modulated ATP release

Juan Liu, Yue Chen, Pengwei Luan, Yelan Wei, Zhaofa Wu, Miao Jing [10'+5']

Presenter affiliation: Chinese Institute for Brain Research, Beijing, China; Peking University, Beijing, China.

13

TUESDAY, April 25—7:00 PM

POSTER SESSION

Odd numbers present 7:00 pm – 8:15 pm

Even numbers present 8:15 pm – 9:30 pm

LRRK2 G2019S attenuates repair of brain injury by reducing osteopontin expression and release of monocytic exosomes

Jiawei An, Haijie Yang, Sang Myun Park, Yong-Joon Chwae, Eun-Hye Joe

Presenter affiliation: Ajou University School of Medicine, Suwon, Kyunggi-do, South Korea.

14

Astrocytes alleviate neuronal tau propagation by ingesting tau proteins through a synapse phagocytic receptor

Yeseong Choi, Won-Suk Chung

Presenter affiliation: Korea Advanced Institute of Science and Technology, Daejeon, South Korea.

15

Investigating the mechanisms of glial phagocytosis in response to neural activity

Young-Jin Choi, Won-Suk Chung

Presenter affiliation: Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea.

16

Systemic infection triggers a dopamine surge that suppresses microglial inflammation via dopamine D1 receptor

Mohammed E Choudhury, Yuki Nishikawa, Kanta Mikami, Hajime Yano, Masahiro Nagai, Satoru Yamagishi, Toshihiro Yorozyu, Junya Tanaka

Presenter affiliation: Ehime University Graduate School of Medicine, Toon, Japan.

17

Unraveling the untapped pathology of schizophrenia—Hypomyelination

Martina von der Bey, Janina Breining, Susanne Zach, Bastian Hengerer, Ebru Ercan Herbst

Presenter affiliation: BioMed X Institute, Heidelberg, Germany.

18

- Mechanisms underlying mutant astrocyte-mediated white matter degeneration in Alexander disease**
Yuto Kubota, Eiji Shigetomi, Kozo Saito, Youichi Shinozaki, Kenji Kobayashi, Kenji F. Tanaka, Nobuhiko Ohno, Schuichi Koizumi
 Presenter affiliation: Univ. Yamanashi, Chuo-city, Japan; Yamanashi GLIA center, Chuo-city, Japan. 19
- Anti-inflammatory clearance of amyloid beta by a chimeric Gas6 fusion protein**
Se Young Lee, Hyuncheol Jung, Sungjoon Lim, Hyeong Ryeol Choi, Yeseong Choi, Minjin Kim, Segi Kim, Yujean Lee, Kyung Ho Han, Won-Suk Chung, Chan Hyuk Kim
 Presenter affiliation: KAIST, Daejeon, South Korea. 20
- RIPK1 and MLKL function as key drivers of glioblastoma malignancy**
Jixi Li
 Presenter affiliation: Fudan University, Shanghai, China. 21
- Whole-brain in vivo base editing reverses autistic-like behaviors in mice**
Weike Li, Jinlong Chen, Wanling Peng, Bo Yuan, Yiting Yuan, Zhenyu Xue, Jincheng Wang, Wenjian Han, Zhifang Chen, Shifang Shan, Biqing Xue, Shuqian Zhang, Cheng Zhang, Shujia Zhu, Yilin Tai, Tianlin Cheng, Zilong Qiu
 Presenter affiliation: Institute of Neuroscience, CAS Center for Excellence in Brain Science and Intelligence Technology, Shanghai, China. 22
- Digoxin ameliorates glymphatic transport and cognitive impairment in a mouse model of chronic cerebral hypoperfusion**
 Di Yao, Rong Li, Xinghua Liu
 Presenter affiliation: Tongji Hospital, Wuhan, China. 23
- Chronic in vivo imaging technique for simultaneous analysis of microglial dynamics and neuronal activity with a sub-second temporal resolution**
Hisato Maruoka, Ryosuke Kamei, Shunsuke Mizutani, Qingrui Liu, Shigeo Okabe
 Presenter affiliation: The University of Tokyo, Tokyo, Japan. 24

Immunological and transcriptomics evidence of glial and nonglial cell transformations in injured human peripheral nerve

Paula V. Monje, Jorge E. Quintero, Gabriela Aparicio, Monica J. Chau, Andrew S. Welleford, Sarah J. Messmer, Greg A. Gerhardt, Craig G. van Horne

Presenter affiliation: University of Kentucky College of Medicine, Lexington, Kentucky.

25

Astrocyte-targeting therapy through Nrf2 potentiation mitigates cognitive impairment caused by neuroinflammation

Akiko Nakano-Kobayashi, Andres Canela, Toru Yoshihara, Masatoshi Hagiwara

Presenter affiliation: Kyoto University, Kyoto, Japan.

26

Choroid plexus ependymal macrophages derive from parenchymal microglia

Bijay Parajuli, Eiji Shigetomi, Shuichi Koizumi

Presenter affiliation: University of Yamanashi, Chuo, Japan.

27

Adenosine-independent regulation of the sleep-wake cycle by astrocyte activity

Wanling Peng, Xiaotong Liu, Guofen Ma, Zhaofa Wu, Ziyue Wang, Xiang Fei, Meiling Qin, Lizhao Wang, Yulong Li, Siyu Zhang, Min Xu

Presenter affiliation: Chinese Academy of Sciences, Shanghai, China.

28

From pathogenesis to treatment—Discovering targets for drug development with patient-derived microglia

Hazel Quek, Carla Cuní-López, Romal C. Stewart, Michelle L. Lupton, Xin Huang, Yi Chieh Lim, Tara L. Roberts, Colin L. Masters, Vincenzo La Bella, Anthony R. White

Presenter affiliation: QIMR Berghofer Medical Research Institute, Brisbane, Australia; The University of Queensland, Brisbane, Australia; Queensland University of Technology, Brisbane, Australia.

29

Astrocytic regulation of neuronal hyper-excitability—The role of an excitatory molecule derived from astrocytes

Eiji Shigetomi, Hideaki Suzuki, Yukiho J. Hirayama, Fumikazu Sano, Shuichi Koizumi

Presenter affiliation: Interdiscipl Grad Sch Med, University of Yamanashi, Chuo, Japan.

30

- A positive feedback loop of FGF signaling induces astrocyte expansion and folding of the cerebral cortex in gyrencephalic animals**
Yohei Shinmyo, Hiroshi Kawasaki
 Presenter affiliation: Kanazawa University, Kanazawa, Japan. 31
- Astrocyte-mediated neuronal circuit remodeling in higher visual cortex induced by sensory**
Ikuko Takeda, Izumo Takei, Mio Inoue, Yuki Aoyama, Hiroaki Wake
 Presenter affiliation: Nagoya University, Graduate School of Medicine, Nagoya, Japan; National Institute for Physiological Sciences, Okazaki, Japan. 32
- Hexokinase driven microglial functions contributes to cerebral ischemia.**
Fang Wang, Yaling Hu, Kelei Cao, Yuxiang Luo, Weiyang Wu, Shumin Duan, Zhihua Gao
 Presenter affiliation: The Second Affiliated Hospital Zhejiang University School of Medicine, Hangzhou, China; Liangzhu Laboratory, Hangzhou, China; NHC and CAMS Key Laboratory of Medical Neurobiology, Hangzhou, China. 33
- Melatonin alleviates depression-like behaviors and cognitive dysfunction in mice by regulating the circadian rhythm of AQP4 polarization**
 Minghuan Wang, Di Yao, Rong Li, Xinghua Liu, Wei Wang
 Presenter affiliation: Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China. 34
- Potential effect of Vimentin on biological behavior of ENSCs after spinal cord injury by regulating autophagy**
 Xiaomin Zhang, Jie Zhao, Yinru Liang, Liji Chen, Jiahong Chen, Manqi Cai, Tao He, Hongfu Wu
 Presenter affiliation: Guangdong Medical University, Dongguan, China. 35
- The microglial innate immune receptors TREM-1 and TREM-2 in anterior cingulate cortex (ACC) drive visceral hypersensitivity and depressive-like behaviors following DSS-induced colitis**
Ke Wu, Yue-ying Liu, Shuai Shao, Yong-mei Zhang
 Presenter affiliation: Xuzhou Medical University, Xuzhou, China. 36
- Fibrinogen-like protein 2 in spinal astrocytes contributes to neuropathic pain**
YaRu Yang, YanFang Kong, LingJie Ma, YongJing Gao
 Presenter affiliation: Nantong University, Nantong city, China. 37

Physical exercise modulates the microglial complement pathway in mice to relieve cortical circuitry deficits induced by mutant human TDP-43

Ji-an Wei, Li Zhang

Presenter affiliation: Jinan University, Guangzhou, China.

38

Microglial and peripheral myeloid cells TREM-1 in triggering dopaminergic neuronal death in Parkinson's disease model

Yong-mei Zhang, Wei Song, Tong Shen, Yue-ying Liu

Presenter affiliation: Xuzhou Medical University, Xuzhou, China.

39

Social Hour

WEDNESDAY, April 26—9:30 AM

SESSION 3 MICROGLIA

Chairpersons: **Helmut Kettenmann**, Max-Delbrück Center for Molecular Medicine, Berlin, Germany / Shenzhen Institute of Advanced Technology, China

Schuichi Koizumi, University of Yamanashi, Chuo, Japan

Specification of CNS macrophage subsets occurs postnatally in defined niches

Marco Prinz [20'+10']

Presenter affiliation: University of Freiburg, Freiburg, Germany.

40

Death and regeneration—The philosophy of microglia

Bo Peng [20'+10']

Presenter affiliation: Fudan University, Shanghai, China.

41

Microglia in multi-sensory modality

Hiroaki Wake, Akari Hashimoto [20'+10']

Presenter affiliation: Nagoya University Graduate School of Medicine, Nagoya, Japan; National Institute for Physiological Sciences, Okazaki, Japan.

42

Break

In vivo imaging of the phagocytotic dynamics underlying efficient clearance of adult-born hippocampal granule cells by ramified microglia

Ryosuke Kamei, Shigeo Okabe [20'+10']

Presenter affiliation: The University of Tokyo, Tokyo, Japan.

43

Microglial MERTK eliminates phosphatidylserine-displaying inhibitory post-synapses

Jungjoo Park, Yeeun Choi, Eunji Jung, Seung-Hee Lee, Jong-Woo Sohn, Won-Suk Chung [10'+5']

Presenter affiliation: Korea Advanced Institute of Science and Technology, Daejeon, South Korea.

44

WEDNESDAY, April 26—1:30 PM

Excursion to Hemeji Castle

WEDNESDAY, April 26—7:00 PM

SESSION 4 GLIA AND NEUROLOGICAL DISEASE I

Chairpersons: **Mami Noda**, Xi'an Jiaotong University, Xi'an, China
Li Zhang, Jinan University, Guangzhou, China

Intracellular mechanisms of spinal microglial proliferation under neuropathic pain conditions

Bao-Chun Jiang, Ting-Yu Ding, Chang-Yun Guo, Xiao-Bo Wu, Long-Jun Wu, Yong-Jing Gao [20'+10']

Presenter affiliation: Nantong University, Nantong, China.

45

A new mechanism for pain chronicity revealed by microglia

Makoto Tsuda [20'+10']

Presenter affiliation: Kyushu University, Fukuoka, Japan.

46

***Cspg4^{high}* microglia contribute to microgliosis during neurodegeneration**

Jia-wei Zhou [20'+10']

Presenter affiliation: CAS Center for Brain Science and Intelligence Technology, Shanghai, China.

47

Break

Microglia, type 1 interferon signaling and ischemic preconditioning in white matter

Ashley McDonough, Margaret A. Hamner, Bruce R. Ransom, Jonathan R. Weinstein [20'+10']

Presenter affiliation: University of Washington, Seattle, Washington. 48

Age associated changes to modulation of neuronal gain by microglia

Philip Hwang, Hayley Strasburger, Ana Badimon, Andrew Chan, Brittany Hemmer, Malli Ganesana, Sophia Lamsifer, Iván Soler, Jill Venton, Erin Calipari, Viviana Gradinaru, Tristan Shuman, Anne Schaefer [10'+5']

Presenter affiliation: Icahn School of Medicine at Mount Sinai, New York, New York. 49

THURSDAY, April 27—9:30 AM

SESSION 5 GLIA AND NEUROLOGICAL DISEASE II

Chairperson: **Helmut Kettenman**, Max-Delbrück Center for Molecular Medicine, Berlin, Germany / Shenzhen Institute of Advanced Technology, China

Repulsive guidance molecule regulates glial and immune function under neurological diseases

Toshihide Yamashita [20'+10']

Presenter affiliation: Graduate School of Medicine, Osaka University, Suita, Japan; Graduate School of Frontier Biosciences, Suita, Japan; WPI Immunology Frontier Research Center, Suita, Japan. 50

Human schwann cells to the rescue: progress and opportunities in translational medicine

Paula V. Monje [20'+10']

Presenter affiliation: University of Kentucky College of Medicine, Lexington, Kentucky.

Break 51

Microglia drive transient insult-induced brain injury by chemotactic recruitment of CD8⁺ T lymphocytes.

Zhongshan Shi, Pei Yu, Wei-Jye Lin, Sitai Chen, Xia Hu, Siqi Chen, Jinping Cheng, Shaojian Li, Yamei Tang [10'+5']

Presenter affiliation: Sun Yat-Sen Memorial Hospital, Guangzhou, China.

52

Heterogeneous microglial response to cancer cells visualized by *in vivo* imaging model

Takahiro Tsuji, Mariko Shindo, Daisuke Kato, Hiroaki Wake [10'+5']

Presenter affiliation: Graduate School of Medicine, Nagoya University, Nagoya, Japan.

53

Astrocytes dysfunction induced by ABCA1 deficiency causes normal-tension glaucoma-like phenotype in mouse

Youichi Shinozaki, Alex Leung, Kazuhiko Namekata, Nobuhiko Ohno, Eiji Shigetomi, Kenji Kashiwagi, Takayuki Harada, Shin-Ichi Ohnuma, Schuchi Koizumi [10'+5']

Presenter affiliation: University of Yamanashi, Yamanashi, Japan; Tokyo Metropolitan Inst. Med. Sci., Tokyo, Japan.

54

THURSDAY, April 27—2:00 PM

SESSION 6 SHORT TALKS

Chairpersons: **Schuichi Koizumi**, University of Yamanashi, Chuo, Japan
 Jixi Li, Fudan University, Shanghai, China
 Hiroaki Wake, Nagoya University, Nagoya, Japan

The crosstalk between astrocyte and oligodendrocyte precursor cell during neocortical development

Chenju Yi, Stephen Fancy, Jianqin Niu [10'+5']

Presenter affiliation: Seventh Affiliated Hospital of Sun Yat-sen University, Shenzhen, China.

55

A conserved E3 ubiquitin ligase complex is required for RNA-binding protein turnover and microRNA metabolism during oligodendrocyte differentiation and myelination

Jing Lei, Siming Zhong, Xin Shu, Guan Wang, Jiansheng Guo, Rong Fan, Bing Yang, Xing Guo, Shumin Duan, Zhiping Wang [10'+5']

Presenter affiliation: Zhejiang University School of Medicine, Hangzhou, China; Zhejiang University School of Brain Science and Brain Medicine, Hangzhou, China.

56

CSF1R antagonism abolishes ischemic preconditioning mediated protection in white matter

Ashley McDonough, Margaret A. Hamner, Cara Nielson, Davin C. Gong, Levi J. Todd, German Rojas, Christopher B. Ransom, Thomas A. Reh, Bruce R. Ransom, Jonathan R. Weinstein [10'+5']
Presenter affiliation: University of Washington, Seattle, Washington. 57

Break

Decoding the neuronal and glial regulation of sleep homeostasis by motivation in mice

Michael Lazarus, Koustav Roy, Tsuyoshi Saitoh [10'+5']
Presenter affiliation: University of Tsukuba, Tsukuba, Japan. 58

Microglia release adenosine directly under the regulation of postsynaptic neurons.

Kent Sakai, Eiji Shigetomi, Schuichi Koizumi [10'+5']
Presenter affiliation: Univ. of Yamanashi, Yamanashi, Japan. 59

Tbx1 in neonatal stem cells links oligodendrogenesis, myelination, and cognitive speed in mice

Takeshi Hiramoto, Shuken Boku, Akira Sumiyoshi, Takahira Yamauchi, Qian Shi, Gina Kang, Anne M. Wells, Rie Ryoke, Hiroi Nonaka, Mariel Barbachan e Silva, Kenji Tanigaki, Kenny Ye, Pilib Ó Broin, Manzoor A. Bhat, Ryuta Kawashima, Noboru Hiroi [10'+5']
Presenter affiliation: UT Health San Antonio, San Antonio, Texas. 60

Break

CHD8 mutations increase gliogenesis to enlarge brain size in non-human primate

Bang Li, Hui Zhao, Zhuchi Tu, Weili Yang, Yong Q. Zhang, Xiao-Jiang Li [10'+5']
Presenter affiliation: Chinese Academy of Sciences, Beijing, China. 61

Advanced 3D microglia-like cell *in vitro* models for improved biomarker discovery and patient stratification in pre-clinical drug studies for Alzheimer's disease

Carla Cuní-López, Romal Stewart, Tam Hong Nguyen, Michelle L. Lupton, Anthony R. White, Hazel Quek [10'+5']
Presenter affiliation: QIMR Berghofer Medical Research Institute, Brisbane, Australia; The University of Queensland, Brisbane, Australia. 62

Engineering of a brain penetrant TREM2 antibody to enhance microglia function and metabolism for Alzheimer's disease

Lihong Zhan [10'+5']

Presenter affiliation: Denali Therapeutics, South San Francisco, California.

63

Closing Remarks

THURSDAY, April 27—6:30 PM

COCKTAILS and BANQUET