

23

DANDRITE REPORTING



AARHUS UNIVERSITY



DANDRITE
Danish Research Institute of Translational Neuroscience
Nordic EMBL Partnership for Molecular Medicine

Cover:

Dopaminergic neurons generated by lineage-restricted human undifferentiated stem cells grafted in a Parkinson's disease rat model.

Green: Dopaminergic neurons (TH).

Red: Human nuclear antigen (HNA).

Blue: Nuclear (DAPI).

Photo by: Assistant Professor Muwan Chen in Mark Denham Lab, 2023

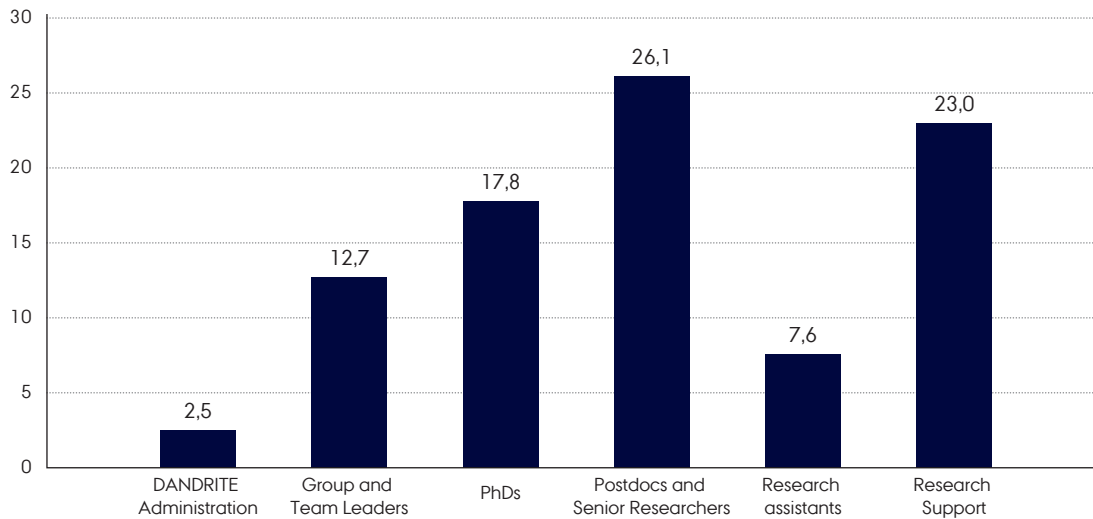
DANDRITE Reporting 2023

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Personnel

The following pages display different graphical presentations of DANDRITE statistics. All counts exclude affiliated researchers.

FULL TIME EQUIVALENT (FTE) 2023



Personnel figure 1: Graphic representation of number of personnel in 2023 counted in FTE - Full Time Equivalent for appointed categories summarized: DANDRITE Administration, Group and Team Leaders, PhDs, Postdocs and Senior Researchers, Research assistants, and Research Support.

COUNT OF NUMBER AND PERCENTAGES OF PERSONNEL EMPLOYED DURING 2023 GROUPED BY APPOINTMENT CATEGORY AND GENDER. FTE COUNT.

DANDRITE Personnel categories	Female	Male	Total	Percentage of personnel categories %
DANDRITE Administration	2,5		2,5	2,8
Group and Team Leaders	1,0	11,7	12,7	14,1
PhDs	12,0	5,9	17,8	19,9
Postdocs and Senior Researchers	13,5	12,7	26,1	29,1
Research assistants	4,8	2,8	7,6	8,5
Research Support	18,9	4,1	23,0	25,6
Grand Total	52,6	37,1	89,8	100
Percentage of Female/Male %	59	41	100	

GRAPHIC REPRESENTATION OF THE PERSONNEL COUNTS FOR 2023
(NUMBERS GROUPED BY APPOINTMENT CATEGORY AND GENDER).

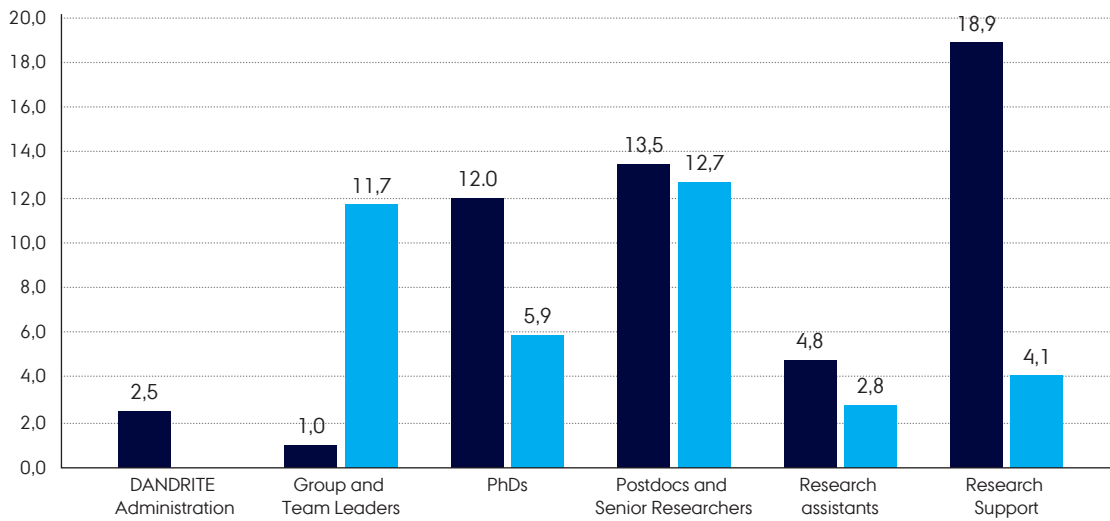


Figure 3: Graphic representation of the personnel counts for 2023 (numbers grouped by appointment category and gender).

PERCENTAGE OF FEMALE/MALE

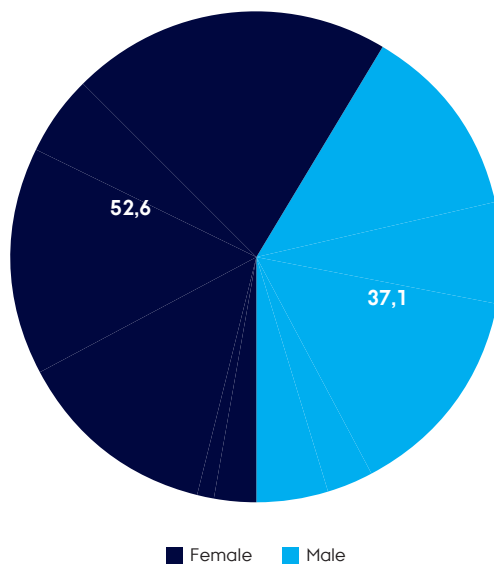


Figure 4: Graphic representation of the personnel counts for 2023 grouped by gender.

GRAND TOTAL OF DANDRITE PERSONNEL (FTE)
FOR THE YEARS' 2020-2023

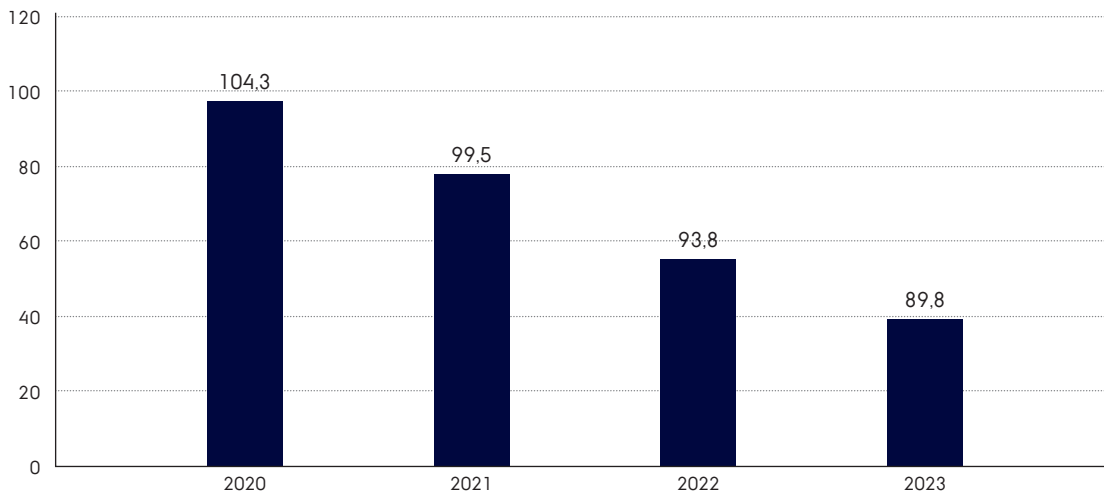


Figure 5: Graphic representation of personnel progression from 2020 through 2023 for appointment categories (FTE count). Since DANDRITE's inauguration in 2013, and until 2019, staff development has been characterized by considerable growth each year. Since 2021, the number of staff has started to decrease as the first cohort of five GLs is ramping down their activities because they are finishing their contracts and preparing for the next step. In the coming years, we expect an increase in staff since the new cohort of GLs is establishing their labs and recruiting staff members.

GRAPHIC REPRESENTATION OF THE NATIONALITY DISTRIBUTION
OF ALL EMPLOYEES. IN TOTAL 31 NATIONALITIES.

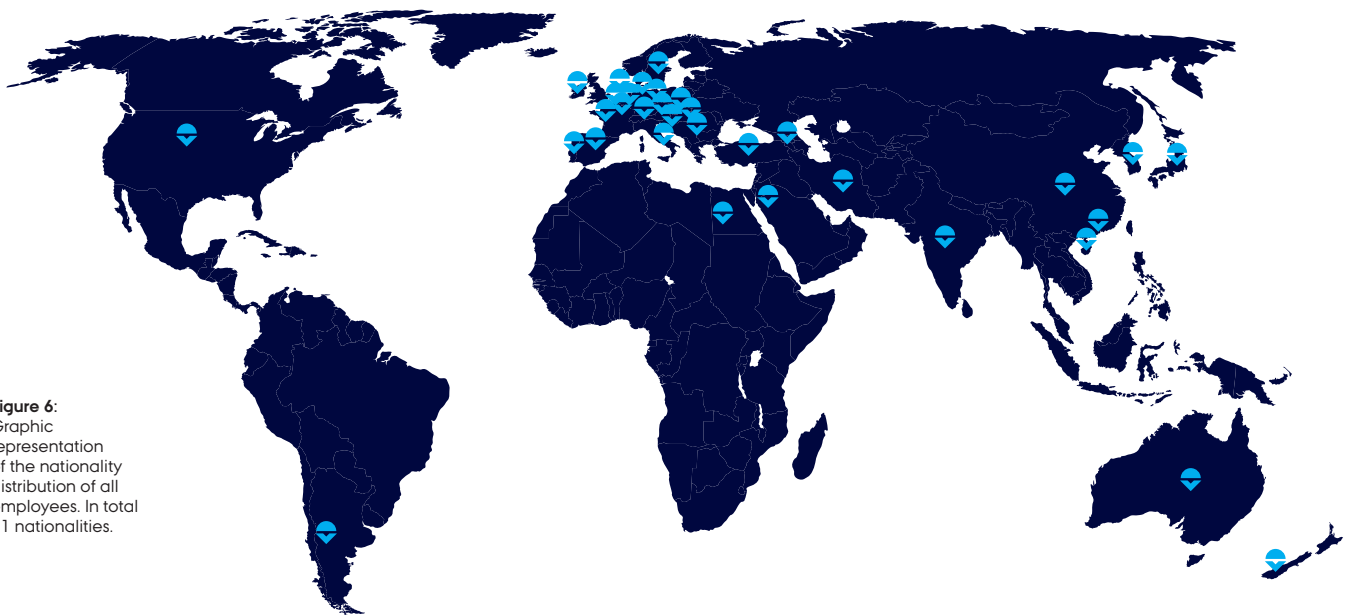


Figure 6: Graphic representation of the nationality distribution of all employees. In total 31 nationalities.

- Argentina (1) Australia (2) Belgium (2) Chile (1) China (3) Czech Republic (4) Denmark (60) Egypt (1) France (2) Georgia (1)
- Germany (5) Holland (1) Hong kong (1) Hungary (1) India (2) Iran (3) Ireland (1) Italy (4) Japan (9) Korea (1) New Zealand (1)
- Poland (1) Portugal (4) Romania (2) Serbia (1) Singapore (1) Spain (1) Sweden (2) Syria (1) Turkey (2) USA (3)

GRAPHIC REPRESENTATION OF THE NATIONALITY DISTRIBUTION OF THE EMPLOYEES IN DANDRITE'S EMBL RECRUITED GL'S RESEARCH GROUPS. IN TOTAL 16 NATIONALITIES.

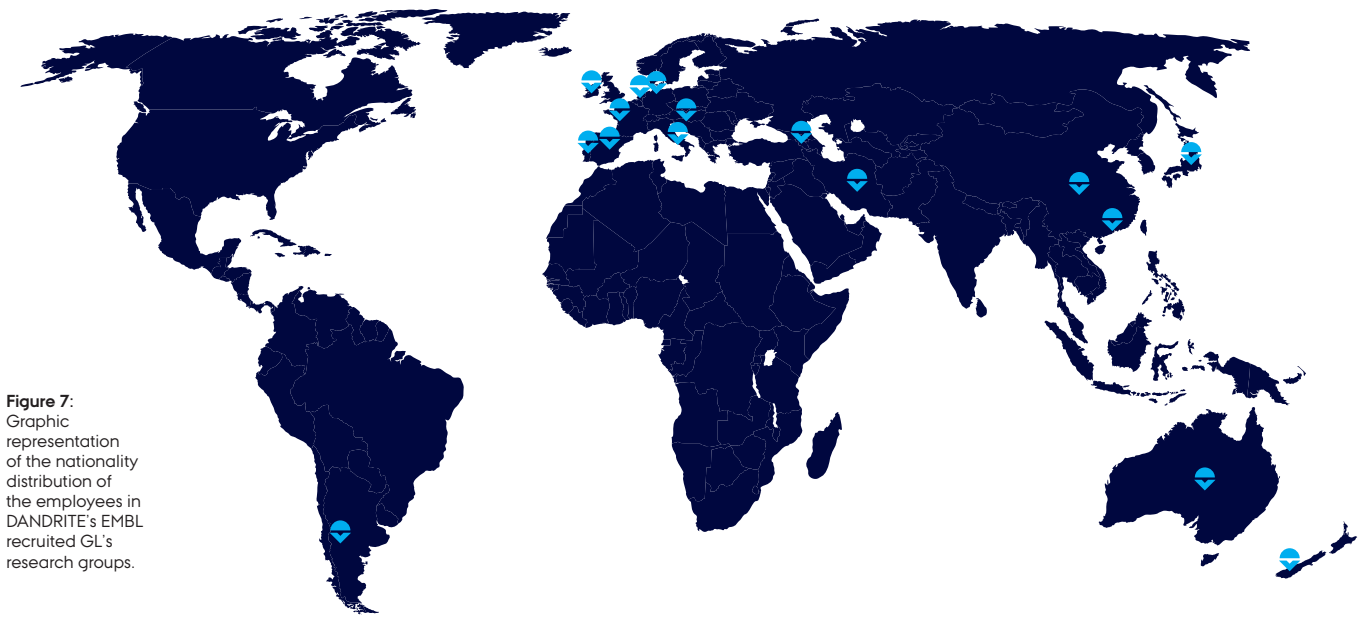


Figure 7:
Graphic representation of the nationality distribution of the employees in DANDRITE's EMBL recruited GL's research groups.

Argentina (1) Australia (1) China (2) Denmark (16) France (1) Georgia (1) Holland (1) Hong kong (1)
Hungary (1) Iran (3) Ireland (1) Italy (4) Japan (6) New Zealand (1) Portugal (1) Spain (1)

Awards and Prizes



DANDRITE GL **Taro Kitazawa** was selected as one of the 15 neuroscience investigators to join the esteemed FENS-Kavli Network of Excellence. Over the next four years, Taro will play a significant role in shaping the future of neuroscience in Europe as the first member rooted in a Danish research institution to join this prestigious network.

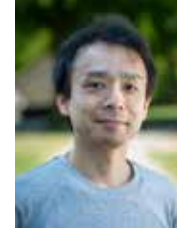
Poster Prizes



PhD student **Clara N. Pedersen** was awarded the best short talk at the PhD Conference 2023 hosted by the Department of Molecular Biology and Genetics

Grants

1. Group Leader **Mark Denham**: InnoExplorer - Developing a Stem Cell Therapy for Parkinson's Disease with Lineage-Restricted Stem Cells, DKK 1.500.000, Innovationsfonden
2. Postdoc **Rasmus Flygaard**: Hallas-Møller Emerging Investigator - Structural and biochemical studies of cardiolipin biosynthetic pathways to unveil their mechanisms and regulation in bacteria and mitochondria, DKK 10.000.000, Novo Nordisk Foundation
3. PhD student **Thomas Heger**: Travel grant, DKK 33.374, Boehringer Ingelheim Foundation
4. Research Assistant **Kaho Itoh**: Scholarship for excellent PhD candidates, DKK 461.000, Murata Overseas Scholarship Foundation
5. Senior Group Leader **Poul Henning Jensen**: CMA as a Means to Counteract alpha-Synuclein Pathology in Non-human primates, DKK 269.000, M. J. Fox Foundation
6. Senior Group Leader **Poul Henning Jensen**: Development of a rodent α -synuclein aggregate PLA technique to detect the novel non-inclusion aggregate-pathology, DKK 254.000, Parkinsonsforeningen
7. Group Leader **Thomas Kim**: Deciphering factors shaping dopamine expression, DKK 167.994, Parkinsonsforeningen
8. Group Leader **Taro Kitazawa**: Deciphering the logic of stimulus-response gene regulation by distinct kinase, DKK 3.000.000, Lundbeck Foundation (LF-NIH-Brain Initiative)
9. Assistant Professor **Noémie Mermet-Joret**: Are hardwired circuits the brain's scaffold for learning?, DKK 1.999.998, Lundbeck Foundation
10. Group Leader **Sadegh Nabavi**: Multi-level analysis of brain mechanisms underlying epigenetic inheritance of superb learning capabilities, DKK 4.998.087, The Novo Nordisk Foundation
11. Senior Group Leader **Poul Nissen**: Cryo-EM resarech network/training, DKK 3.375.000, CryoNET
12. Senior Group Leader **Anders Nykjær**: Second grant period, Center of Excellence: Center for Proteins in Memory - PROMEMO. 4 years, 6 Pls., DKK 53.100.000, Danish National Research Foundation
13. Postdoc **Lasse Reimer**: Lundbeck Foundation Frontier Grant, DKK 5.000.000, Lundbeck Foundation
14. Team Leader **Tomonori Takeuchi**: Kamoseni agreement, DKK 765.000, Kamoseni
15. Team Leader **Tomonori Takeuchi**: Memory selectivity and knowledge updating, DKK 22.750, Portocuere
16. Team leader **Gilles Vanwalllehem**: Exploratory Interdisciplinary Synergy Program, DKK 5.000.000, The Novo Nordisk Foundation
17. Team Leader **Gilles Vanwallghem**: Hallas-Møller emerging investigator, DKK 10.000.000, The Novo Nordisk Foundation
18. PhD Student **Lucie Woloszczukov**: EMBO Scientific Exchange Grant, DKK 49.000, EMBO



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Invited talks and Outreach

JANUARY

Poul Henning Jensen: *Patofysiologi ved PD og mulige targets*, Yngre Neurologer, Neurokirurger og Neurofysiologer, Denmark

MARCH

Poul Henning Jensen: *Introduction to animal models of Parkinson's disease*, 2. German-Scandinavian Meeting on Movement Disorders, Germany

Tomonori Takeuchi: *Memory 101: Dive Deep from the Beginning*, Mitaka NETWORK University, Japan

Chao Sun: *Synaptic Machinery for Protein Homeostasis*, GRC dendrites, Italy

Alena Salasova: *From brain development to a disorder: Receptor signaling behind neurodevelopmental psychiatric disorders*, DKFZ, Heidelberg, Germany

APRIL

Gilles Claude Vanwallghem: *Zebrafish as a transparent model of the gut-brain axis*, RIKEN institute, Japan

Gilles Claude Vanwallghem: *Neuroimmunity along the gut-brain axis of zebrafish*, Brain Research Institute, Japan

Chao Sun: *Synaptic Machinery for Molecular Homeostasis*, University of Hannover, Germany

Taro Kitazawa: *Epigenetic and transcriptional basis of neuroplasticity*, RIKEN Center for Brain Science, Japan

Anders Nykjær: *Sorting out a secret of life – from womb to walker*, Brain Research Institute, Japan

Poul Henning Jensen: *The unappreciated alpha-synuclein-aggregate pathology – a source for the wider symptomatology of synucleinopathies?*, Brain Research Institute, Japan

Poul Nissen: *The role of Na,K-ATPase and plasma-membrane Ca²⁺-ATPase in neuropsychiatric disorders*, Brain Research Institute, Japan

Taro Kitazawa: *Epigenetic and transcriptional basis of neuroplasticity*, Brain Research Institute, Japan

Keisuke Yonehara: *Neural circuits for visually-mediated behaviors in the mouse*, Brain Research Institute, Japan

Taro Kitazawa: *Epigenetic and transcriptional basis of neuroplasticity*, University of Tokyo, Japan

Taro Kitazawa: *Epigenetic and transcriptional basis of neuroplasticity*, Osaka University, Japan

Poul Henning Jensen: *Alpha-synuclein, a coat of many colors*, Webinar

MAY

Tomonori Takeuchi: *Modulation of hippocampal-dependent memory by several experiences*, Spring Hippocampal conference, Italy

Poul Nissen: *Structure and mechanism of membrane transporters and receptors in brain*, Webinar

Lilian Kisiswa: *TROY/RIP2 signalling drives neurite degeneration during aging*, Gordon Research Conference: Neurotrophic Mechanisms in Health and Disease, USA

Keisuke Yonehara: *Emergence of spatially asymmetric neural connections in the mouse retina*, Brain Research Institute, Japan

Pia Boxy: *SorCS2 single-chain impairs cerebellar morphology and excitability: implications for cognitive and motor function*, Gordon Research Seminar: Neurotrophic Mechanisms in Health and Disease, USA

JUNE

Poul Henning Jensen: *Alpha-synuclein aggregates, why does a neuron care?*, Parkinson's disease: subtypes, pathogenesis, biomarkers, and the direction of future research: 1st Sandbjerg meeting, Denmark

Poul Nissen: *Looking to the Future – New Challenges, New Directions? Synergies with a 'mother' university*, AIAS Annual Meeting, Denmark

Thomas Kim: *HyDD (Hypothalamus Developmental Database)*, Single Cell and Spatial OMICS 2023 conference, Aarhus University, Denmark

Keisuke Yonehara: *Use of AAV and genetically-modified rabies virus for visual circuit mapping*, ARVO SIG, USA

Thomas Kim: *The molecular logic of neuronal specification in the zona incerta and reticular thalamic nucleus*, Hypothalamus Symposium, University of Copenhagen, Denmark

JULY

Keisuke Yonehara: *Dynamics of neural activity in the mouse superior colliculus under various behavioral conditions*, University of Tokyo, Japan

Keisuke Yonehara: *Development of cell-contact-mediated viral labeling technique*, The 2nd CJK meeting, Zhuhai, China

Chao Sun: *Synaptic Machinery for Protein Homeostasis*, EBSA satellite meeting, Sweden

AUGUST

Taro Kitazawa: *Epigenetic and transcriptional basis of neuroplasticity*, The 46th Annual Meeting of Japanese Neuroscience Society, Japan

Gilles Claude Vanwallghem: *Light-sheet imaging workshop*, Aarhus University, Denmark

Keisuke Yonehara: *Comprehensive GABA imaging in the mouse retina*, Neuro 2023, Japan



Photos: Roar Lava Paaske/AU-Kommunikation and Lars Kruse/AU Kommunikation

Keisuke Yonehara: *GABA imaging for understanding spatiotemporal coding of sensory features*, International Leading Research Retreat, Japan

Taro Kitazawa: *Epigenetic and transcriptional basis of neuroplasticity*, University of Tokyo, Japan

Poul Nissen: *Structure and Mechanism of Dopamine Transporter Inhibition*, Brain in Flux - MSCA NeuroTrans Joint Satellite Meeting, Portugal

Poul Henning Jensen: *Physiological and pathological alpha-synuclein – structures and functions*, MDS International congress of Parkinson's Disease and Movement Disorders, Denmark

Keisuke Yonehara: *Understanding of critical period for the reorganization of inhibitory connections in the developing retinas*, University of Tokyo, Japan

SEPTEMBER

Gilles Claude Vanwalleghem: *The transparent Zebrafish as a window into neurological diseases*, Nordic EMBL meeting, Finland

Thomas Kim: *Building the hypothalamus*, Zoophysiology, Aarhus University, Denmark

Poul Henning Jensen: *α -Synuclein Biology Update. Alpha-Synuclein as a Therapeutic Target*, University of Helsinki, Finland

Keisuke Yonehara: *Diverse neural activity in the mouse superior colliculus*, University of Helsinki, Finland

Thomas Kim: *Building the hypothalamus*, Webinar

Poul Nissen: *Autoinhibition and activation of P4-ATPase lipid flippases*, RESOLUTE conference on "Unlocking transporters for drug discovery", Austria

OCTOBER

Hanne Poulsen: *Structural aspects of ATP1A3 mutations*, ATP1A3 disease, USA

Sean Hansen: *Finding the AIS in a Sea of Ice: Towards Axon Initial Segment Ultrastructure by cryo-ET*, 2023 cryoNET symposium, Sweden

Taro Kitazawa: *Recording cellular memory to unveil the mechanisms of brain memory*, FENS-Kavli Network of Excellence 2023 Symposium, France

Chao Sun: *Synaptic Machinery for Protein Homeostasis*, Nanjing University, China

Anders Nykjær: *Sortilin and SorCS2: brothers in arms in PGRN processing and function*, Bluefield Investigator Meeting, USA

Chao Sun: *Synaptic Machinery for Molecular Homeostasis*, Zhejiang University Hospital, China

Chao Sun: *Synaptic Machinery for Molecular Homeostasis*, CSH Asia, China

Rasmus Kock Flygaard: *Alumne-panel member*, MBG's PhD conference, Aarhus University, Denmark

Chao Sun: *Synaptic Machinery for Molecular Homeostasis*, Chinese Academy of Sciences, China

Chao Sun: *In situ Protein Copy Counting at Brain Synapses*, Shanghai Jiaotong university, China

Rasmus Kock Flygaard: *Presentation of research at Danish National cryo-EM facility*, HALRIC career workshop "Connecting structural biologists with industry and research infrastructures", University of Copenhagen, Denmark

Chao Sun: *Imaging synaptic Machinery for Protein Homeostasis*, Webinar

NOVEMBER

Chao Sun: *Synaptic Machinery for Molecular Homeostasis*, Weill Cornell Medical School, USA

Chao Sun: *Synaptic Machinery for Molecular Homeostasis*, Georgetown University, USA

Thomas Kim: *The molecular logic of neuronal specification in the zona incerta and reticular thalamic nucleus*, University of Otago, New Zealand

DECEMBER

Taro Kitazawa: *Recording cellular memory to unveil the mechanisms of brain memory*, NCMM Multi-Omics PhD course, Norway

Thomas Kim: *Leveraging - Omics to understand the molecular mechanisms of microglia across neurodegeneration*, University of Auckland, New Zealand

Publications 2023

Peer-reviewed

1. **Almeida Ferreira, SR**, Li, C, Klæstrup, IH, Vitic, Z, Rasmussen, RK, Kirkegaard, A, Toft, GU, **Betzer, C**, Svendsen, P, **Jensen, PH, Luo, Y**, Etzerodt, A, Moestrup, SK & **Romero-Ramos, M** 2023, 'Sex-dimorphic neuroprotective effect of CD163 in an α -synuclein mouse model of Parkinson's disease', *npj Parkinson's Disease*, vol. 9, no. 1, 164, pp. 164. <https://doi.org/10.1038/s41531-023-00606-w>
2. Amin, H, **Nolte, SS, Swain, B & von Philipsborn, AC** 2023, 'GABAergic signaling shapes multiple aspects of *Drosophila* courtship motor behavior', *iScience*, vol. 26, no. 11, 108069. <https://doi.org/10.1016/j.isci.2023.108069>
3. Amstrup, SK, Ong, SC, Sofos, N, Karlsen, JL, Skjerning, RB, **Boesen, T**, Enghild, JJ, Hove-Jensen, B & Brodersen, DE 2023, 'Structural remodelling of the carbon-phosphorus lyase machinery by a dual ABC ATPase', *Nature Communications*, bind 14, 1001. <https://doi.org/10.1038/s41467-023-36604-y>
4. Andersen-Civil, AIS, Sawale, RA & **Vanwalleghem, GC** 2023, 'Zebrafish (*Danio rerio*) as a translational model for neuro-immune interactions in the enteric nervous system in autism spectrum disorders', *Brain, Behavior, and Immunity*, vol. 112, pp. 254-266. <https://doi.org/10.1016/j.bbi.2023.06.001>
5. Ansariifar, S, Andreiké, G, **Nazari, M**, Labouriau, R, **Nabavi, S & Moreno, A** 2023, 'Impact of volume and expression time in an AAV-delivered channelrhodopsin', *Molecular Brain*, vol. 16, no. 1, 77. <https://doi.org/10.1186/s13041-023-01067-1>
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7. **Boxy, P, Nykjær, A & Kisiswa, L** 2023, 'Building better brains: the pleiotropic function of neurotrophic factors in postnatal cerebellar development', *Frontiers in Molecular Neuroscience*, vol. 16, 1181397. <https://doi.org/10.3389/fnmol.2023.1181397>
8. Breinbjerg, A, Jørgensen, CS, Borg, B, Rittig, S, Kamperis, K & **Christensen, JH** 2023, 'The genetics of incontinence: A scoping review', *Clinical Genetics*, bind 104, nr. 1, s. 22-62. <https://doi.org/10.1111/cge.14331>
9. Brindley E, Heiland M, Mooney C, Diviney M, Mamad O, Hill TDM, Yan Y, Venø MT, Reschke CR, Batool A, Langa E, Sanz-Rodriguez A, Heller JP, Morris G, Conboy K, **Kjems J, Brennan GP, Henshall DC**. 2023, 'Brain cell-specific origin of circulating microRNA biomarkers in experimental temporal lobe epilepsy', *Front Mol Neurosci*. 2023 Sep 22;16:1230942. [10.3389/fnmol.2023.1230942](https://doi.org/10.3389/fnmol.2023.1230942)
10. **Chen, M**, Niclis, JC & **Denham, M** 2023, 'Protocol for generating reproducible miniaturized controlled midbrain organoids', *STAR Protocols*, vol. 4, no. 3, 102451. <https://doi.org/10.1016/j.xpro.2023.102451>
11. Darooei, R, **Nazari, M**, Kafieh, R & Rabbani, H 2023, 'Dual-Tree Complex Wavelet Input Transform for Cyst Segmentation in OCT Images Based on a Deep Learning Framework', *Photonics*, vol. 10, no. 1, 11. <https://doi.org/10.3390/photonics10010011>
12. Darooei, R, **Nazari, M**, Kafieh, R & Rabbani, H 2023, 'Optimal Deep Learning Architecture for Automated Segmentation of Cysts in OCT Images Using X-Let Transforms', *Diagnostics*, vol. 13, no. 12, 1994. <https://doi.org/10.3390/diagnostics13121994>
13. Darooei, R, **Nazari, M**, Kafieh, R & Rabbani, H 2023, 'Loss-modified transformer-based U-Net for accurate segmentation of fluids in optical coherence tomography images of retinal diseases', *Journal of Medical Signals and Sensors*, vol. 13, no. 4, pp. 253-260. https://doi.org/10.4103/jmss.jmss_52_22
14. **Davis, FM** 2023, 'DEI conversations: more than a box-ticking exercise', *Nature Reviews Molecular Cell Biology*, vol. 24, no. 4, pp. 238. <https://doi.org/10.1038/s41580-022-00565-9>
15. **Davis, FM**, Elias, S & Ananthanarayanan, V 2023, 'Scientists with intersecting privilege must work towards institutional inclusion', *Nature Cell Biology*, vol. 25, no. 6, pp. 789-792. <https://doi.org/10.1038/s41556-023-01143-7>
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17. **Dieudonné, T**, Jaxel, C, Lejeune, M, Lenoir, G & Montigny, C 2023, 'Expression in *Saccharomyces cerevisiae* and Purification of a Human Phospholipid Flippase'. in Â Sousa & L Passarinha (eds), *Advanced methods in structural biology*, Humana Press, New York, *Methods in Molecular Biology*, vol. 2652, pp. 231-246. https://doi.org/10.1007/978-1-0716-3147-8_13
18. **Dieudonné, T**, Kümmerer, F, Laursen, MJ, **Stock, C, Flygaard, RK**, Khalid, S, Lenoir, G, Lyons, JA, Lindorff-Larsen, K & Nissen, P 2023, 'Activation and substrate specificity of the human P4-ATPase ATP8B1', *Nature Communications*, vol. 14, 7492. <https://doi.org/10.1038/s41467-023-42828-9>

19. Duszkievicz, AJ, Rossato, JI, **Moreno, A, Takeuchi, T**, Yamasaki, M, Genzel, L, Spooner, P, Canals, S & Morris, RGM 2023, 'Execution of new trajectories toward a stable goal without a functional hippocampus', *Hippocampus*, vol. 33, no. 6, pp. 769-786. <https://doi.org/10.1002/hipo.23497>
20. Dzamko, N, **Romero-Ramos, M** & Thaler, A 2023, 'Editorial: Updates on inflammation in Parkinson's disease', *Frontiers in Neurology*, vol. 14, 1138543. <https://doi.org/10.3389/fneur.2023.1138543>
21. Fahlquist-Hagert, C, Wittenborn, TR, Terczyńska-Dyla, E, Kastberg, KS, Yang, E, Rallistan, AN, Markett, QR, Winther, G, Fonager, S, Voss, LF, Pedersen, MK, van Campen, N, Ferapontov, A, Jensen, L, Huang, J, Nieland, JD, van der Poel, CE, Palmfeldt, J, Carroll, MC, Utz, PJ, **Luo, Y**, Lin, L & Degn, SE 2023, 'Antigen presentation by B cells enables epitope spreading across an MHC barrier', *Nature Communications*, vol. 14, no. 1, 6941. <https://doi.org/10.1038/s41467-023-42541-7>
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25. **Fruergaard, MU, Nielsen, CJF**, Kjeldsen, CR, Iversen, L, Andersen, JL & **Nissen, P** 2023, 'Activation and inhibition of the C-terminal kinase domain of p90 ribosomal S6 kinases', *Life science alliance*, vol. 6, no. 5, e202201425. <https://doi.org/10.26508/lsa.202201425>
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29. **Heger, T, Stock, C**, Laursen, MJ, **Habeck, M, Dieudonné, T** & **Nissen, P** 2023, 'eGFP as an All-in-One Tag for Purification of Membrane Proteins', In *Methods in Molecular Biology*, vol. 2652, Humana Press, New York, *Methods in Molecular Biology*, vol. 2652, pp. 171-186. https://doi.org/10.1007/978-1-0716-3147-8_9
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PhD Dissertations 2023

- Christensen, ME** 2023, Structural and functional characterization of human Na,K-ATPases. Aarhus University.
- Gram, H** 2023, Characterization of structural and functional differences in α -synuclein aggregate strains. Aarhus University.
- Hansen, SB** 2023, Catching Calcium Transport in Motion: Structures and Dynamics. Aarhus University.
- Schwartz, OS** 2023, Response Space Dimensionality and Classification of Cells in the Mouse Superior Colliculus. Aarhus University.
- Sevillano Quispe, OG** 2023, Studies on the C-terminal domain of the NMDA receptor subunit GluN1: allosteric modulation and channel properties. Aarhus Universitet.
- Sietam, MD** 2023, Genetic mechanisms underlying eye disease. Aarhus University.
- Swain, B** 2023, GABAergic signaling shapes multiple aspects of *Drosophila* courtship motor behavior. Aarhus Universitet.

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