



PROGRAM FOR THE CONFERENCE

Developing Brains

13th Edition

Nobel Forum, Karolinska Institutet
Stockholm, Sweden
October 7, 2026



**Karolinska
Institutet**

Foreword

The pioneering work of Santiago Ramon y Cajal and Camillo Golgi in the late 1800s opened the way to the understanding of the complexity of the brain and led to the award of the Nobel Prize in Physiology or Medicine in 1906. Since then, many other discoveries on how the brain structures work have been awarded the Nobel Prize in Physiology or Medicine.

Nevertheless, many overarching questions regarding how these brain structures arise and function remain unanswered. For instance, how can a single cell give rise to complex structures such as the central nervous system (brain/spinal cord) and peripheral nervous system, which includes the enteric brain in the gut?

The 13th edition of the KI Conference “Developing Brains” will gather international and national leading scientists with expertise in these areas at the Nobel Forum at Karolinska Institutet. These scientists will give lectures and discuss the latest advances in our knowledge of how brain structures develop.

Warm welcome to this year’s edition of The Developing Brains!

*Gonçalo Castelo-Branco, Jens Hjerling-Leffler,
Ulrika Marklund and François Lallemend*

PROGRAMME

ORGANIZERS & CHAIRS

Gonalo Castelo-Branco
Jens Hjerling-Leffler
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Francois Lallemend

October 7th, 2026

Nobel Forum, Karolinska Institutet

09.00 – 09.05	WELCOMING ADDRESS
	Session 1: Chair Francois Lallemend
09.05 – 09.50	DECODING NEURAL FATES WITH NEPTUNE: LINEAGES, MECHANISMS, AND SPATIAL CONTEXT Emma Andersson, Karolinska Institutet, SE
09.50 – 10.35	TIME TO WAKE UP: REGULATION OF NEURAL STEM CELL QUIESCENCE Andrea Brand, New York University Grossman School of Medicine, US
10.35 – 11.00	BREAK
	Session 2: Chair Jens Hjerling-Leffler
11.00 – 11.45	HOW TO BUILD A SYNAPSE: MOLECULAR ASSEMBLY THROUGH SYNAPTIC CELL ADHESION Fredrik Sterky, Gothenburg University, SE
11.45–12.30	THE MOSAIC BRAIN: TRACING CELL LINEAGES AND WHEN THEY GO AWRY Sara Bizzotto, INSERM Paris, FR

12.30 – 13.30	LUNCH
	Session 3: Chair Ulrika Marklund
13.30 – 14.15	BUILDING THE “LITTLE BRAIN” ON THE HEART: DEVELOPMENT AND FUNCTION OF THE INTRINSIC CARDIAC NERVOUS SYSTEM Rui Chang, Yale University, US
14.15 – 15.00	TEMPORAL PATTERNING OF THE VERTEBRATE NERVOUS SYSTEM BY MICRORNAS Andreas Sagner, FAU, DE
15.00 – 15.30	BREAK
	Session 4: Chair: Gonalo Castelo-Branco
15.30 – 16.15	TRANSPOSABLE ELEMENTS AND THE EVOLUTION OF THE HUMAN BRAIN Johan Jakobsson, Lund University, SE
16.15 – 17.00	CHARACTERIZING CIS-REGULATORY ELEMENTS AND GENETIC VARIANTS UNDERLYING THE HUMAN BRAIN DEVELOPMENT AND DISEASE Yin Shen, UCSF, US
17.00 – 17.45	DEVELOPMENT OF A THERAPEUTICALLY EFFECTIVE CELL THERAPY FOR PARKINSON’S DISEASE Johan Ericson, Karolinska Institutet, SE
17.45 – 18.00	CONCLUDING REMARKS



Decoding neural fates with NEPTUNE: Lineages, Mechanisms, and Spatial Context

EMMA ANDERSSON

Karolinska Institutet, Sweden

Emma R. Andersson is an Associate Professor of Developmental Biology at Karolinska Institutet in Stockholm. Her lab seeks to understand how gene regulation and cell fate shape organ development, and how disruption of these processes leads to disease. Her research spans Notch signalling and Alagille syndrome, the molecular principles governing miRNA–mRNA targeting, and the development of new technologies for manipulating and tracing cells in the mammalian embryo.

A major focus of the Andersson lab is overcoming one of the longstanding challenges of mammalian developmental biology: gaining experimental access to the embryo as it develops in utero. Building on work initiated with Elaine Fuchs at Rockefeller University, Andersson developed ultrasound-guided in utero nano-injection approaches that enable highly efficient genetic manipulation of previously inaccessible embryonic tissues. Her early proof-of-principle work at Rockefeller formed the basis for this research direction, which she subsequently developed at KI. Her lab now combines in utero genetic manipulation with cellular barcoding, single-cell genomics and spatial transcriptomics to reconstruct how embryonic progenitors generate complex organs.

Andersson received her PhD in Developmental Neuroscience at Karolinska Institutet with Ernest Arenas, followed by postdoctoral training with Urban Lendahl and guest research with Elaine Fuchs at Rockefeller University. She was awarded an ERC Consolidator Grant in 2024 to develop whole-embryo genetic manipulation and next-generation lineage-tracing technologies. Her work has also been recognized by the EASL Daniel Alagille Award and, most recently, the 2026 Göran Gustafsson Prize in Medicine.

Selected publications:

Liu Z*, Padmanabhan K*, He J, Hector K, Semsch B, Sun J, Knoflach V, Giatrellis S, Lorentz J, Dallakyan K, Göritz C, Andersson ER†, Marklund U†; Resolving cell lineages and gene functions in the developing mouse gastrointestinal tract using in utero transduction, PNAS (2026) <https://doi.org/10.1073/pnas.2614077123>

de Haan S#, He J#, Corbat AA, Belicova L, Ratz M, Vinsland E, Frisé J, Kelley MW, Andersson ER †, Ectoderm barcoding reveals neural and cochlear compartmentalization, Science (2025). PMID: 40179197 <https://doi.org/10.1126/science.adq9248>

Mangold K, Mašek J, He J, Lendahl U, Fuchs E, Andersson ER†, Highly efficient manipulation of nervous system gene expression with NEPTUNE, Cell Reports Methods (2021) PMID: 34557863 <https://dx.doi.org/10.1016/j.crmeth.2021.100043>

Kosek DM, Petzold K, Andersson ER †; Mapping effective microRNA pairing beyond the seed using abasic modifications, Nucleic Acids Research (2025). PMID: 40298108 <https://doi.org/10.1093/nar/gkaf364>

Kosek D, Banijamali E, Becker W, Petzold K†, Andersson ER†, Efficient 3′-pairing PMID: 37819016 <https://dx.doi.org/10.1093/nar/gkad795>

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www.anderssonlab.com



Time to wake up: regulation of neural stem cell quiescence

ANDREA BRAND

NYU Grossman School of Medicine

Andrea H Brand is Frederick L. Ehrman Professor and Chair of the Department of Cell Biology and Director of the Regenerative Medicine Institute at NYU Grossman School of Medicine. She received her BA from Oxford University and her PhD from the MRC Laboratory of Molecular Biology, University of Cambridge, working with Kim Nasmyth. After postdoctoral fellowships with Mark Ptashne at the Department of Biochemistry and Molecular Biology, Harvard University, and with Norbert Perrimon at the Department of Genetics, Harvard Medical School, she returned to the UK to become a Wellcome Trust Senior Fellow at the Gurdon Institute, University of Cambridge. She became Director of Research in Developmental Neurobiology in 2003 and Senior Group Leader in 2005. She was appointed Herchel Smith Professor in Molecular Biology in 2007 and Royal Society Darwin Trust Research Professor in 2015. She was Head of Wellcome Trust Laboratories at the Gurdon Institute from 2015–2022.

Andrea Brand was awarded the Royal Society Rosalind Franklin Award in 2006, the William Bate Hardy Prize, jointly with Professor Robin Irvine, in 2004, the Hooke Medal of the British Society of Cell Biology in 2002 and a Special Award of Excellence at the Wellcome Biomedical Imaging Awards, 2001. She was elected a Fellow of the Royal Society in 2010, Fellow of the Academy of Medical Sciences in 2003, member of the European Molecular Biology Organization in 2000 and was previously a Leukemia Society Special Fellow and a Helen Hay Whitney Fellow. She was elected to the National Academy of Sciences in 2026.

The Brand lab studies the genetic networks that regulate the transition from a multipotent neural stem cell to a specialised neuronal or glial cell type, and those that direct cellular regeneration. With sufficient knowledge of these networks, it should be possible to manipulate stem cells to proliferate, to remain quiescent, or to differentiate into specialised, predefined, cell types at will.

Selected publications:

Gherghina, L.Y., Tang, J.L.Y. and Brand, A.H. (2026) Quiescent neural stem cells transiently become neuron-like to coordinate reactivation. EMBO J., 2026 Jun;45(11):3788–3807. doi: 10.1038/s44318-026-00775-3. Epub 2026 Apr 24. PMID: 42032079

Malkowska, A., Ander, J. and Brand, A.H. (2025) Neural stem cell quiescence is actively maintained by the epigenome. Cell Reports, Dec 18;45(1):116732. doi: 10.1016/j.celrep.2025.116732. Online ahead of print. PMID: 41417732

Otsuki, L. and Brand, A.H. (2018). Cell cycle heterogeneity directs the timing of neural stem cell activation from quiescence. Science 360, 99–102.

Southall, T.D., Gold, K.S., Egger, B., Davidson, C.M., Caygill, E.E., Marshall, O.J. and Brand, A.H. (2013). Cell type-specific profiling of gene expression and chromatin binding without cell isolation: Assaying RNA Pol II occupancy in neural stem cells. Developmental Cell 26, 101–112.

Chell, J.M. and Brand, A.H. (2010). Nutrition-responsive glia control exit of neural stem cells from quiescence. Cell, 143, 1161–73.

Homepage:

<https://andreabrandlab.org>



How to Build a Synapse: Molecular Assembly through Synaptic Cell Adhesion

FREDRIK H. STERKY
University of Gothenburg, Sweden

Fredrik Sterky is an Associate Professor at the Department of Laboratory Medicine, Institute of Biomedicine, and also holds a position as Senior Consultant in Clinical Chemistry at the Sahlgrenska University Hospital.

Dr Sterky has an MD from Uppsala University and subsequently obtained a PhD in the lab of Nils-Göran Larsson at the Karolinska Institute, studying mitochondrial dysfunction in dopamine neurons of genetically modified mice. His finding that presynaptic nerve endings were early affected inspired him to learn more about synapse biology by pursuing a postdoc in the lab of Thomas Südhof at Stanford University (2013–2016).

The Sterky lab focuses on how synaptic cell adhesion receptors (e.g. the neurexins) govern the formation, stabilization and possible turnover of synaptic connections. The lab has pioneered the use of human stem cell-derived neurons for the study of presynapse assembly but also employ patient-derived cells as well as genetic mouse models. The ultimate aim is to identify means to correct synaptic imbalances causing human disease.

Selected publications:

Marcó de la Cruz B, Campos J, Molinaro A, Xie X, Jin G, Wei Z, Acuna C, Sterky FH. Liprin-α proteins are master regulators of human presynapse assembly. Nature Neuroscience 2024;4:629–642.

Noborn F, Sterky FH. Role of Neurexin Heparan Sulfate in the Molecular Assembly of Synapses – Expanding the Neurexin Code? FEBS Journal 2021;2:252–265.

Montoliu Gaya L, Tietze D, Kaminski D, Mirgorodskaya E, Tietze AA, Sterky FH. CA10 regulates neurexin heparan sulfate addition via a direct binding in the secretory pathway. EMBO Reports 2021;162:593–17.

Homepage:
<https://sterkylab.se/>



The mosaic brain: tracing cell lineages and when they go awry

SARA BIZZOTTO
INSERM, Paris, France

Sara Bizzotto is an Inserm Principal Investigator and Director of the laboratory “Somatic Mosaicism in Neurodevelopment and Disease” at the Institut Imagine in Paris. She holds a PhD in Genetics and Neurodevelopment from Sorbonne Université and conducted her postdoctoral research at Harvard Medical School and Boston Children’s Hospital, where she specialized in somatic mosaicism, and subsequently at the Paris Brain Institute. Her work contributed to establishing a proof of concept for using somatic genetic variants as natural markers to trace cell lineages in human tissues, opening new avenues for studying how the human brain develops and acquires its remarkable cellular diversity.

The Bizzotto laboratory investigates somatic mosaicism from two complementary perspectives: as a powerful window into human brain development and as a driver of pediatric neurological disorders. The lab also seeks to uncover the fundamental mechanisms that generate somatic variation, particularly during development and in the context of developmental pathologies.

Sara’s work has received international recognition, including the 2024 FENS-EJN Young Investigator Prize awarded by the Federation of European Neuroscience Societies. She is also the recipient of an ERC Starting Grant (2023).

Selected publications:

Maletic M*, Bizzotto S*, et al. Mosaic human cortical organoids model mTOR-related focal cortical dysplasia through DEPDC5 deletion. Brain (2026)

Bizzotto S*, Talukdar M*, Stronge EA*, et al. Cell-type-informed genotyping of mosaic focal epilepsies reveals cell-autonomous and non-cell-autonomous disease-associated transcriptional programs. Proc. Natl. Acad. Sci. U.S.A. 122 (29) e2509622122 (2025)

Ganz J*, Luquette LJ*, Bizzotto S*, et al. Contrasting somatic mutation patterns in aging human neurons and oligodendrocytes. Cell 187 (8), 1955–1970.e23 (2024)

Bizzotto S and Walsh CA. Genetic mosaicism in the human brain: from lineage tracing to neuropsychiatric disorders. Nat Rev Neurosci 23, 275–286 (2022)

Bizzotto S*, Dou Y*, Ganz J*, et al. Landmarks of human embryonic development inscribed in somatic mutations. Science 371 (6535), 1249–1253 (2021)

Homepage
<https://www.institutimagine.org/en/sara-bizzotto-1745>



Building the “little brain” on the heart: Development and Function of the intrinsic cardiac nervous system

RUI CHANG

Yale University School of Medicine, US

Rui Chang is an Associate Professor of Neuroscience and of Cellular and Molecular Physiology at Yale University School of Medicine. He received his B.S. in Biological Sciences and Biotechnology from Tsinghua University and his Ph.D. in Neuroscience from the University of Southern California, where he studied sensory transduction with Emily Liman. He completed his postdoctoral training with Stephen Liberles at Harvard Medical School, investigating how sensory signals from internal organs are detected by the vagus nerve and communicated to the brain. The Chang lab uses state-of-the-art molecular, genetic, and imaging approaches including single-cell gene expression profiling, virus-based anatomical mapping, in vivo imaging, optogenetics, and chemogenetics to reveal the physiological functions of diverse organ-to-brain circuits. The goal is to better understand the important body-brain interface, and to develop novel neuronal-based therapeutic strategies for disease intervention.

Selected publications:

Xu QJ, Applegate MC, Hsu IY, Kogan RP, Hafez OA, Wang RL, Rios Coronado PE, Young LH, Zeng X, Zhang L, Chang RB. The intrinsic cardiac nervous system is essential for cardiac function and survival. *Cell*. 2026 Jul 22; doi: 10.1016/j.cell.2026.06.040. [Epub ahead of print] PubMed PMID: 42486084.

Hsu IY, Zhao J, Lin Y, Guo Y, Xu QJ, Shao Y, Wang RL, Yin D, Ghoshal K, Mourad R, Pozzi A, Halabi CM, Young LH, Zhao H, Zhang L, Chang RB. Lineage and organ signals sequentially build organ intrinsic nervous systems. *Nature*. 2026 Jul; 655(8122):429–437. doi: 10.1038/s41586-026-10490-y. Epub 2026 May 13. PubMed PMID: 42129551; PubMed Central PMCID: PMC13345970.

Wei HK, Yu CD, Hu B, Zeng X, Ichise H, Li L, Wang Y, Wang RL, Germain RN, Chang RB, Jin C. Tumour-brain crosstalk restrains cancer immunity via a sensory-sympathetic axis. *Nature*. 2026 Feb; 650(8103):1007–1016. doi: 10.1038/s41586-025-10028-8. Epub 2026 Feb 4. PubMed PMID: 41639447; PubMed Central PMCID: PMC12935554.

Zhao Q, Yu CD, Wang R, Xu QJ, Dai Pra R, Zhang L, Chang RB. A multidimensional coding architecture of the vagal interoceptive system. *Nature*. 2022 Mar; 603(7903):878–884. doi: 10.1038/s41586-022-04515-5. Epub 2022 Mar 16. PubMed PMID: 35296859; PubMed Central PMCID: PMC8967724.

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<https://medicine.yale.edu/lab/chang/>



Temporal patterning of the vertebrate nervous system by microRNAs

ANDREAS SAGNER

FAU Erlangen-Nürnberg, Germany

Andreas Sagner is group leader at the Institute for Biochemistry of the Friedrich-Alexander Universität Erlangen-Nürnberg. He received his PhD from Technical University Dresden and Max-Planck Institute of Molecular Cell Biology and Genetics and carried out his postdoctoral research at the Francis Crick Institute in London. In 2021, he established an independent research group funded by the DFG Emmy-Noether Programme in Erlangen.

Using mouse and chicken embryos and stem cell-based differentiation approaches, his lab investigates the molecular mechanisms that generate neuronal subtype diversity during vertebrate development, with a particular emphasis on temporal patterning of neuronal subtypes. During his postdoctoral work, he identified a temporal program, which comprises cohorts of transcription factors that are specific to early-, intermediate-, and late-born neurons and that partition neuronal populations in large parts of the developing nervous system according to their time of birth in embryogenesis. The main goals of his group are to (1) define the molecular signals and gene regulatory networks that control this temporal program, (2) determine how spatial and temporal cues are integrated to produce specific neuronal types, and (3) assess the contribution of this temporal program to neuronal diversity and circuit connectivity. In the long term, such mechanistic understanding of cell fate and connectivity may inform the development of novel disease models and therapies for neurodegenerative disorders and nervous system injuries.

Selected publications:

Delile, J†, Rayon, T., Melchionda, M., Edwards, A., Briscoe, J.* and Sagner, A†,* (2019). Single cell transcriptomics reveals spatial and temporal dynamics of gene expression in the developing mouse spinal cord. *Development* 146, dev173807. *co-corresponding author, †equal contribution

Sagner, A* and Briscoe, J* (2019). Establishing neuronal diversity in the spinal cord: a time and a place. *Development* 146, dev182154.

Sagner, A*, Zhang, I., Watson, T., Lazaro, J., Melchionda, M. and Briscoe, J* (2021). A shared transcriptional code orchestrates temporal patterning of the central nervous system. *PLoS Biol* 19, e3001450.

Sagner, A. (2024). Temporal patterning of the vertebrate developing neural tube. *Current Opinion in Genetics & Development* 86, 102179.

Caudet Segarra, L†, Sangster, K†, Sagner, J., Kania, A* and Sagner, A* (2026). Evidence for chronological diversification of spinal neuron subtypes by a shared sequence of transcription factors. *Science Advances* 12, eadz3075.

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<https://www.biochemie.med.fau.de/research/ag-sagner-en/#research-focus>



Transposable elements and the evolution of the human brain

JOHAN JAKOBSSON

Lund Stem Cell Center, Lund University, Sweden

Johan Jakobsson is a Professor of Neuroscience at the Lund Stem Cell Center at Lund University in Sweden, where he is the Principal Investigator of the Laboratory of Molecular Neurogenetics. He received his PhD from Lund University in 2005 and undertook postdoctoral training at the École polytechnique fédérale de Lausanne in Switzerland, in the laboratory of Didier Trono.

The Molecular Neurogenetics lab studies transposable elements, which are repetitive, mobile DNA sequences that make up at least 50% of our genome. The lab explores how these sequences affect neurodegenerative diseases, human brain evolution, brain tumours and ageing. The lab has expertise in human stem cell cultures, viral vectors, gene editing, cellular reprogramming, single-cell omics, long-read sequencing and advanced bioinformatic analysis. Professor Jakobsson is a former Director of the Lund Stem Cell Centre and has received numerous grants and awards, including prestigious CRN grants from ASAP/MJFF in 2020 and 2026.

Selected publications:

Garza R, Adami A, Thiruvalluvan A, Wijesinghe S, Curle A, Tam O, Forcier T, Lagka DA, Kazakou N, Atacho DAM, Sharma Y, Jönsson M, Horvath V, Bermudez S, Johansson J, Rainbow DB, Castilla-Vallmanya L, Jones JL, Quaegebeur A, Hammell MG, Kirkeby A, Barker RA & Jakobsson J. Activation of transposable elements is linked to a region- and cell-type-specific interferon response in Parkinson's disease. *BioRxiv*

Adami A, Garza R, Gerdes P, Johansson PA, Dorazehi F, Koutounidou S, Castilla-Vallmanya L, Atacho DAM, Sharma Y, Johansson JG, Tam O, Kirkeby A, Barker RA, Gale Hammell M, Douse CH & Jakobsson J. LINE-1 retrotransposons mediate cis-acting transcriptional control in human pluripotent stem cells and regulate early brain development. *Cell Genomics*. 2025 19:100979

Horvath V, Garza R, Jönsson ME, Johansson PA, Adami A, Christoforidou G, Karlsson O, Castilla Vallmanya L, Koutounidou S, Gerdes P, Pandiloski N, Douse CH and Jakobsson J. Mini-heterochromatin domains constrain the cis-regulatory impact of SVA transposons in human brain development and disease. *Nature Structural and Molecular Biology* 2024, 31(10):1543-1556

Garza R, Atacho D, Adami A, Gerdes P, Vinod M, Hsieh P, Karlsson O, Horvath V, Johansson PA, Pandiloski N, Matas J, Quaegebeur A, Kouli A, Sharma Y, Jönsson ME, Monni E, Englund E, Eichler EE, Hammell M, Barker RA, Kokaia Z, Douse CH and Jakobsson J. LINE-1 retrotransposons drive human neuronal transcriptome complexity and functional diversification. *Science Advances* 2023 9:eadh9543

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<https://www.molecular-neurogenetics.lu.se>



Characterizing cis-regulatory elements and genetic variants underlying the human brain development and disease

YIN SHEN

UCSF, US

Dr. Yin Shen is a professor at the Institute for Human Genetics and the Department of Neurology at the University of California, San Francisco. She obtained a B.S. degree in Biological Sciences and Technologies from Nanjing University in China and a Ph.D. degree in Human Genetics from UCLA before completing postdoctoral training in Dr. Bing Ren's laboratory at the Ludwig Institute for Cancer Research and UCSD. Dr. Shen joined UCSF in 2015.

The Shen lab at UCSF is dedicated to investigating how 3D epigenome and non-coding sequences contribute to gene regulation, development, and diseases. They particularly focus on leveraging 3D genome information to understand gene regulatory controls in brain development and to prioritize disease-associated variants for functional studies. Additionally, the Shen lab develops and applies novel CRISPR approaches for characterizing candidate cis-regulatory elements and disease-associated variants in iPSC models. Dr. Shen has been an active member of the ENCODE and the 4D Nucleome consortium, contributing to the annotation of non-coding regulatory sequences in the human genome.

Selected publications:

Ren X, Zheng L, Maliskova L, Tam TW, Sun Y, Liu H, Lee J, Takagi MA, Li B, Ren B, Wang W, Shen Y. CRISPR tiling deletion screens reveal functional enhancers of neuropsychiatric risk genes and allelic compensation effects (ACE) on transcription. *Nature Communications* 2026 Mar 25. PMID: 41881989.

Cui X*, Yang H*, Cai C, Beaman C, Yang X, Liu H, Ren X, Amador Z, Jones IR, Keough KC, Zhang M, Fair T, Abnoui A, Mishra S, Ye Z, Hu M, Pollen AA, Pollard KS, Shen Y. Comparative characterization of human accelerated regions in neurons. *Nature*. 2025 Feb 26. doi: 10.1038/s41586-025-08622-x. PMID: 40011774.

Ren X*, Yang H*, Nierenberg JL, Sun Y, Chen J, Beaman C, Pham T, Nobuhara M, Takagi MA, Narayan V, Li Y, Ziv E, Shen Y. High throughput PRIME editing screens identify functional DNA variants in the human genome. *Molecular Cell* 2023 Dec 21;83(24):4633-4645.e9. PMID: 38134886.

Yang X, Wen J, Yang H, Jones IR, Zhu X, Liu W, Li B, Clelland CD, Luo W, Wong MY, Ren X, Cui X, Song M, Liu H, Chen C, Eng N, Ravichandran M, Sun Y, Lee D, Van Buren E, Jiang MZ, Chan CSY, Ye CJ, Perera RM, Gan L, Li Y#, Shen Y#. Functional characterization of Alzheimer's disease genetic variants in microglia. *Nature Genetics* 2023 Sep 21. PMID: 37735198.

Song M*, Pebworth MP*, Yang X*, Abnoui A, Jones IR, Cui X, Wen J, Fan C, Eze U, Maliskova L, Bergenholtz S, Choudhary MNK, Juric I, Pollen A, Wang T, Li Y, Hu M*,#, Kriegstein A#, Shen Y#. (2020) Cell-type-specific 3D epigenomes in the developing human cortex. *Nature* 2020 Nov;587(7835):644-649. PMID: 33057195.

Homepage

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Development of a therapeutically effective cell therapy for Parkinson's disease

JOHAN ERICSON

Karolinska Institutet, Sweden

Johan Ericson is Professor of Developmental Neurobiology at Karolinska Institutet. He has extensive expertise in developmental neurobiology and has made important contributions in defining signalling mechanisms and downstream transcriptional networks that govern spatial and temporal control of neuronal fate specification in the developing central nervous system. Based on developmental principles, his group has developed multiple protocols for producing clinically relevant neuronal subtypes from mouse and human pluripotent stem cells, and when relevant validated their functional properties in preclinical animal models.

Selected publications:

Alekseenko, Z., Dias, J.M., Adler, A.F., Kozhevnikova M., van Lunteren J.A., Nolbrant S., Jeggari, A., Vasylovska S., Yoshitake, T., Kehr, J., Carlén, M., Alexeyenko, A., Parmar, M. and Ericson, J. (2022) Robust derivation of transplantable dopamine neurons from human pluripotent stem cells by timed retinoic acid delivery. *Nat Commun*, 13: 3046.

Dias, J.M., Alekseenko, Z., Jeggari, A., Boareto, M., Vollmer, J., Kozhevnikova, M., Matise, M.P., Alexeyenko, A., Iber, D. and Ericson J. (2020) A Shh/Gli-driven three-node timer motif controls temporal identity and fate of neural stem cells. *Sci Adv*. Sep; 6(38):eaba819

Dias, J.M., Alekseenko, Z., Applequist J.M. and Ericson J. (2014) Tgfb signaling regulates temporal neurogenesis and potency of neural stem cells in the CNS. *Neuron*, 84:927-939.

Oosterveen, T., Kurdija S., Ensterö, M. Uhde, C.W., Bergsland, M., Sandberg M., Sandberg, R., Muhr J. and Ericson J. (2013) SoxB1-driven transcriptional network underlies neural-specific interpretation of morphogen signals. *Proc. Natl. Acad. Sci. USA*, 110:7330-7335.

Andersson E., Tryggvason (Marklund) U., Deng Q., Friling S., Alekseenko Z., Robert B., Perlmann T. and Ericson J. (2006) Identification of intrinsic determinants of midbrain dopamine neurons. *Cell*, 124:393-405.

Homepage:

<https://ki.se/en/research/research-areas-centres-and-networks/research-groups/stem-cells-and-neural-development-johan-ericsons-research-group>

SCIENTIFIC ORGANIZERS

GONÇALO CASTELO-BRANCO

Gonçalo is Professor of Glial Cell Biology at the Department of Medical Biochemistry and Biophysics, Karolinska Institutet, Stockholm, Sweden, and a member of the Nobel Assembly at the Karolinska Institutet. His research group is interested in the molecular mechanisms defining the epigenetic state of cells of the oligodendrocyte lineage, with the long-term goal of designing epigenetic based therapies to induce regeneration (remyelination) in demyelinating diseases, such as multiple sclerosis. His group focuses on how interplay between transcription factors, non-coding RNAs and chromatin modifying enzymes contribute to the transition between epigenetic states within the oligodendrocyte lineage, using technologies such as single cell transcriptomics and epigenomics, among others.

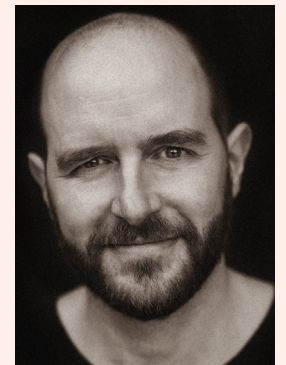
<https://ki.se/en/research/research-areas-centres-and-networks/research-groups/goncalo-castelo-branco-group>



JENS HJERLING-LEFFLER

Jens is Professor of Molecular Psychiatry at the Department of Medical Biochemistry and Biophysics, Karolinska Institutet, Stockholm, Sweden. His group's research is focused on how functional neuronal identity is regulated during postnatal and adolescent brain maturation and different brain states from a molecular and network point of view. The laboratory applies methods such as advanced mouse genetics, human genetics, single-cell transcriptomics and electrophysiology to analyze the role of distinct cell classes in normal behavior as well as to increase understanding of genetically complex disorders and traits including Schizophrenia.

hjerling-leffler-lab.org



ULRIKA MARKLUND

Ulrika is an Associate Professor at the Department of Medical Biochemistry and Biophysics, Karolinska Institutet, Stockholm, Sweden. Her research focuses on neuronal diversity in the enteric nervous system of the gastrointestinal tract. In particular she is interested in understanding the gene regulatory networks and signaling mechanisms that control the diversification of enteric neural stem cells into the many functionally distinct neuronal subtypes. Her ultimate goal is to recapitulate fate determination and circuitry formation in the purpose of disease modeling and cell-based therapy of bowel neuropathology.

marklundlab.org



FRANÇOIS LALLEMEND

François is Professor of Neurobiology of Sensory Systems at the Department of Neuroscience, Karolinska Institutet, Stockholm, Sweden. His research group is interested in understanding the molecular principles underlying the neuronal specification and neural circuit formation in the peripheral nervous system. His group particularly focuses on the integration of sensory neurons into functional circuits involved in the control of motor behavior and in hearing process. Research in his lab concentrates both on early development aspects and circuit mapping and function in adult.

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Photo: Stefan Zimmerman

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