

CV: Assist. Prof. PhD Barbara Lykke Lind.

Date of birth: 19th of February 1981

Married and with 2 children.

<https://orcid.org/0000-0003-0027-5226>

Academic Degrees:

- October 14th 2013: **PhD in neuroscience, University of Copenhagen.**

Title: *Fast astrocytic Ca²⁺ responses in neurovascular coupling, Subcellular astrocytic Ca²⁺ activity reflects neuronal activation and precedes blood flow responses during somatosensory stimulation in vivo*

- April 16th 2007: **Master of science humanbiology, University of Copenhagen.**

Thesis Project title: *A study of the mechanisms that leads from NMDA excitotoxic stimulation to pronounced lesion formation in mouse cortex.*

Supervisors: Professor M.D. Gitte Moos Knudsen at the University of Copenhagen and Professor M.D. Ph.D. Maiken Nedergaard at the University of Rochester

- June 25th 2003: **Bachelor in Biology, University of Copenhagen.**

Academic positions:

- August 1st 2019- Now, **Assistant Professor at Department of Neuroscience** at the University of Copenhagen.

• August 1st 2017- 31st of July 2019, **Post.doc** in Professor Ph.D. Andrea Volterra laboratory at the University of Lausanne. On leave from the position at the University of Copenhagen.

• October 1st 2016- 31st of July 2017, **Assistant Professor** at the University of Copenhagen.

• September 1st 2013- July 25th 2016, **Post.doc** in Professor M.D. Ph.D. Martin Lauritzen laboratory at the University of Copenhagen.

Scientific focus: How brain state influence the astrocytic response to and support of neuronal synaptic activity and regulation of neurovascular coupling in active sensing.

Funding and Awards:

- 6.190.572 kr, from Danmarks Frie Forskningsfond 28 May 2021, as collaborator
- 10.000 kr from Familien Hede Nielsens Fond 7. October 2020
- 50.000 kr from Dagmar Marshalls Fond. 3. August 2020.
- 200.000 kr from Hørslev Fonden. 29. June 2020.
- 375.000 kr from Læge Sofus Carl Emil Friis og Hustru Olga Doris Friis' Legat 11. June 2020.
- 800.000 kr from the Lundbeck Foundation for covering expenses and salary for two years as a post.doc in the laboratory of Professor Andrea Volterra at University of Lausanne, Switzerland. Received confirmation on the contribution 23. March 2016 and the 26. March 2018.
- 14.098 kr from the Lundbeck Foundation, covering travel expenses with regards to the Gordon conference on Glial biology, Venturra, CA 2017. 21. March 2017.
- 7.760 kr from Pharma Danmark Uddannelsesfonden, covering travel expenses during Brain conference in Shanghai China 2013. 27. March 2013.

Invited talks:

- Short Talk, 9th *International Conference on Brain Energy Metabolism*. 2010, Budapest, Hungary
- Talk in the student forum of FORSK!2011, the 28. September 2011, at the Panum Institute, Faculty of Health sciences, University of Copenhagen.

- Talk at the 10th FENS Forum 2016 in Copenhagen. Title: "Rapid stimulus-evoked astrocyte Ca²⁺ elevations and hemodynamic responses in mouse somatosensory cortex.
- Lecture at the Ph.D. course: *Neuron Glia Interactions*. 2013, KU, Copenhagen. DK
- Short talk at FENS meeting in Copenhagen 2016.
- Short Talk, *Cellular and molecular Neurobiology of Mental Disease*. 2019, Giessbach, Switzerland.
- Short Talk, Brain Prize meeting: *Silently losing the Brain*. 2019, Snekkersten, Copenhagen. DK
- Lecture at the Ph.D. course: *The Vascular Brain*. 2020, Karolinska, Stockholm. Sweden.
- Neurotalk at University of Copenhagen, November 2020
- Lecture at the Ph.D. course: *Neuron-glia signaling underlying brain behaviour*. 2021, KU, Copenhagen DK.
- Talk at InsideScientific Webinar, sponsored by the company Neurotar: *Neurovascular Coupling: Novel Insights from Studies in Awake Head-Fixed and Anesthetized*. 2022.

International relations:

Professor Andrea Volterra, Wyss Center, Genève, Switzerland

Assistant professor Moritz Armbruster, Tufts University School of Medicine, Boston

Professor Tania Barkat, University of Basel, Switzerland.

Professor Alexey Brazhe, Moscow State University, Russia

Professor Gilles Bonvento, MIRCen, University Paris Descartes, France.

Professor David Attwell, University College London, UK.

Professor Brian MacVicar, University of British Columbia, Canada.

Professor Grant Gordon at University of Calgary, Canada

Supervision:

•Bachelor projects:

-Medical student Florence Tan in the project: *The role of astrocytic calcium as a mediator in neurovascular coupling*, in May 2011.

-Medical students Anne Sophie Overgaard Olesen and Hannah Sophie Bryde Laursen in the project: *Cortical Spreading Depression, Spiller astrocytterne en rolle?*, in December 2015.

-Biology student Søren Emil Nørr in the project: *Microglia and astrocyte activation in Alzheimers Dementia* in November 2016.

-Medical student Yangzhi Zhou in the project: *Alzheimer's pathogenic mechanisms elucidated by transgenic mouse models* in October 2020

-Molecular biomedicine student Flora Gro Lorentzen Thomassen in extra-curriculum project: *Acetylcholine Imaging in Awake and Naturally Behaving Mice* in November 2023

•Master projects:

-Human biology student Jakob Akbar Stelzner in the project: *Characterizing Calcium Transients in Cortical Somatosensory Neurons and the Neurovascular Response during Natural Whisking*. Finalized August 2022.

-Master in Neuroscience student Caroline Degel in an external project at Lundbeck: *Meningeal blood vessel imaging for validation of treatment principles in headache disorders*. Finalized June 2024.

•Phd students:

-Aske Krogsgaard Jensen, Finalized May 17th 2022,

-Fangyuan Li since June 2022

-Co-supervisor: Christina Fjordbak since January 2020,

Periods of leave:

November 17th 2011-September 1st 2012 due to maternity.

June 19th 2014-May 13th 2015 due to maternity.

August 1st 2017- 31st of July 2019 on leave to do a post. doc. abroad.

Publications, Barbara Lykke Lind.

13

De Ceglia R., Ledonne A, Litvin D, **Lind B.L.**, Carriero G, Latagliata E.C., Bindocci E, Di Castro M.A., Savtchouk I.A., Vitali I, Ranjak A, Congiu M, Canonica T, Wisden W, Harris K, Mameli M, Mercuri N, Telley L and Andrea Volterra. Specialized astrocytes mediate glutamatergic gliotransmission in the central nervous system. *Nature*. **2023**. Sep. 10. <https://doi.org/10.1038/s41586-023-06502-w>

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Krogsgaard A., Sperling L., Li, F., Dahlqvist M., Thomsen K., Vydmantaitė G., Li F., Thunemann M., Lauritzen M, **Lind B.L.** PV interneurons evoke astrocytic Ca²⁺ responses in awake mice, which contributes to neurovascular coupling. *Glia*. **2023**. <https://doi.org/10.1002/glia.24370>

11

Cai C., Zambach S.A., Grubb S., Tao L., He C., Thomsen K.J., **Lind B.L.**, Hald, B.O., Lønstrup M., Nielsen R.M., Lauritzen M.J. Impaired dynamics of brain precapillary sphincters and pericytes at first order capillaries explains reduced neurovascular functions in aging. *Nature Aging* volume **3**, pages173–184 **2023**.

<https://doi.org/10.1038/s43587-022-00354-1>

10

Fordsmann J., Nielsen R., Cai C., Brazhe A., Thomsen K., Zambach S. A., Lonstrup M., Lind B. L., Lauritzen M. J. Ion activity in mice offers insight into how to save stroke-stricken older brains. *Research Square*.

2019. doi:10.21203/rs.2.15069/v1

9

Fordsmann J.C., Murmu R.P., Cai C., Brazhe A., Thomsen K.J., Zambach S.A., Lønstrup M., **Lind B. L.**, and Lauritzen M. Spontaneous astrocytic Ca²⁺ activity abounds in electrically suppressed ischemic penumbra of aged mice. *Glia*. **2019**; Jan;67(1):37-52. doi: 10.1002/glia.23506.

8

Christensen R.K., Delgado-Lezama R., Russo R.E., **Lind B.L.**, Alcocer E.L., Rath M.F., Fabbiani G., Schmitt N., Lauritzen M., Petersen A.V., Carlsen E.M., Perrier J.F. Spinal dorsal horn astrocytes release GABA in response to synaptic activation. *J Physiol*. **2018** Oct;596(20):4983-4994. doi: 10.1113/JP276562

7

Lind B. L., Jessen S. B., Lønstrup M. and Lauritzen M. Fast Ca²⁺ responses in astrocyte end-feet and neurovascular coupling in mice. *Glia*. **2018** Feb;66(2):348-358. doi: 10.1002/glia.23246. Epub 2017 Oct 23.

6

Howarth C., Sutherland B.A., Choi H.B., Martin C., **Lind B.L.**, Khennouf L., LeDue J.M., Pakan J.M.P., Ko R.W., Ellis-Davies G.C.R., Lauritzen M.J., Sibson N.R., Buchan A.M., MacVicar B.A. A critical role for astrocytes in hypercapnic vasodilation in brain. *Journal of neuroscience*. **2017** Mar 1:37(9):2403-2414. Doi.10.1532/JNEUROSCI.0005-16.2016.

5

Jessen S.B., Mathiesen C., **Lind B.L.** and Lauritzen M. Interneuron deficit associates attenuated network synchronization to mismatch of energy supply and demand in aging mouse brains. *Cerebral Cortex*. **2017** Jan 1;27(1): 646-659. Doi:10.1093/cercor/bhv261.

4

Khennouf L., Gesslein B., **Lind B.L.**, van den Maagdenberg A.M.J.M. and Lauritzen M. Activity-dependent calcium, oxygen, and vascular responses in a mouse model of familial hemiplegic migraine type 1. *Ann Neurol*. **2016** Aug;80(2):219-32. Doi:10.1002/ana.24707.

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Jessen S.B., Brazhe A., **Lind B.L.**, Mathiesen C., Thomsen K., Jensen K. and Lauritzen M. GABAA receptor-mediated bidirectional control of synaptic activity, intracellular Ca²⁺, cerebral blood flow and oxygen consumption in mouse somatosensory cortex *in vivo*. *Cereb Cortex*. **2015** Sep; 25(9):2594-609.

2

Brazhe A., Mathiesen C., **Lind B.**, Rubin A., Lauritzen M. Multiscale transforms and compressive sensing for 2-photon imaging data. *Neurophotonics*. **2014** Jul;1(1):011012.

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Lind B. L., Brazhe A., Jessen S. B., Tan F. and Lauritzen M. Rapid stimulus-evoked astrocytic Ca²⁺ elevations and hemodynamic responses in mouse somatosensory cortex *in vivo*. *PNAS*, **2013** Nov 26; 110(48):E4678-87.

Non-reviewed publication:

15

Lind B.L. and Volterra A. Fast 3D imaging in the auditory cortex of awake mice reveals that astrocytes control neurovascular coupling responses locally at arteriole-capillary junctions. *BioRxiv*. **2024** June. BioRxiv ID: BIORXIV/2024/601145. Search with underlined number in the search window on bioRxiv:

<https://www.biorxiv.org/>

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Stelzner, J.A., Krogsgaard A., Kulkoviene G., Sperling L., **Lind B.L.** Localised Astrocyte Ca²⁺ Activity Regulates Neurovascular Coupling Responses to Active Sensing. *BioRxiv*. **2024** April;

<https://doi.org/10.1101/2024.04.16.589720>. Currently under review in *Nature Communications*