CHRISTIAN L. EBBESEN, PhD

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have **12+ years academic & industry research experience** in applying **data science, deep learning, machine learning and computational statistics** in **innovative analyses** of a wide range of **"real world" biological, pre-clinical and clinical data**: From characterizing the activity of single neurons, to understanding the topology of activity in complex networks, mapping the structure of complex behavioral data (touch, movement, postures and social interactions) to charting clinical laboratory test results, treatment patterns and disease outcomes in the electronic health records of millions of patients.

CURRENT POSITION

2023-Now **Director, Head of Data Science Department, Lundbeck A/S,** Valby, Denmark
Our department supports research projects across the pre-clinical and clinical research organization with AI, ML and advanced analysis: Neuroscience, drug discovery and drug development.

2021-2023 **Deep Learning Specialist, Data Science Department, Lundbeck A/S,** Valby, Denmark
Using artificial intelligence and modeling to develop new ways to support and restore brain health.

2022-Now **Part-time Lecturer, Dept. of Neuroscience**, University of Copenhagen, Copenhagen, Denmark

POSTDOCTORAL EXPERIENCE

2017-2021 **Neuroscience Institute, New York University,** New York, USA
Oxytocin and hormonal control of neural circuits for social behavior

2017-2017 **Institute of Biology, Humboldt Universität zu Berlin**, Berlin, Germany
Cortical network processing of rat social facial touch

EDUCATION

2013-2017 **Ph.D. in Neurobiology** (Dr.rer.nat., *summa cum laude*)
Bernstein Center for Computational Neuroscience / Berlin School of Mind and Brain
Humboldt Universität zu Berlin, Berlin, Germany
Cortical circuits underlying social and spatial exploration in rats

2008-2013 **M.Sc. in Physics, B.Sc. in Biophysics** (average grade: 11.4/12, M.Sc. and B.Sc. thesis: 12)
Niels Bohr Institute, University of Copenhagen, Copenhagen, Denmark

FUNDING (Academic and Industry Research)

2023-2025 **Co-PI: Innovation Fund Denmark, Industrial PhD Project** (2.000.000 DKK)
2021-2026 **Lundbeck Foundation Fellowship** (10.000.000 DKK, 5 years, Starting Grant)
–> ***Declined, due to move to industry research.***
2021-2023 **NARSAD Young Investigator Grant** (70.000 USD), Brain & Behavior Research Foundation
Named "Families For Borderline Personality Disorder Research Investigator."
–> ***Ended early (2021), due to move to industry research.***
2017-2021 **Novo Nordisk Foundation Postdoctoral Fellowship** (3.153.645 DKK, 4 years full postdoctoral funding)
2017 **Lundbeck Foundation Talent Prize** (100.000 DKK research prize for scientists under 30 yrs)
2017-2017 **Humboldt Postdoctoral Scholarship** (6 months full postdoctoral funding)

AWARDS AND HONORS (accepted)

2020 **Trainee Professional Development Award**, Society for Neuroscience
2015 **Travel grant**, CSN II (Biomimetics and Neurotechnology)
2014 **Best Poster Award**, FENS Brain Prize Conference: Controlling Neurons, Circuits and Behavior
2010 **Travel grant**, Danish Acoustics Society
2008 **Honorable mention,** International Physics Olympiad, Isfahan University of Technology, Iran

INVITED TALKS (accepted)

2023 **Young Statisticians Denmark**, "Deep Learning and Data Science to map the syllables of animal body language"
2022 **Berlin School of Mind and Brain,** Humboldt Uni. zu Berlin, Event about Neuroscience Research in Industry

2020 **BARRELS XXXIII,** SfN satellite conference (online due to COVID-19)
2020 **Neuromatch Conference** (online due to COVID-19)
2019 **BARRELS XXXII,** SfN satellite conference, Feinberg School of Medicine, Northwestern University, USA
2019 **New Frontiers in the Study of Animal Behaviour**, Association for the Study of Animal Behaviour, University of Konstanz, Germany
2018 ***SfN* Mini-Symposium** (chair and speaker), Society for Neuroscience Annual Meeting, San Diego, USA
2016 **BARRELS XXIX,** SfN satellite conference, Brain and Creativity Institute, University of Southern California, USA
2016 **Barrel Cortex Function**, "Multidisciplinary, international meeting on sensory (sub)cortical circuits", VU University, Amsterdam, The Netherlands
2016 **Young Brain Researchers Conference,** Gonda Multidisciplinary Brain Research Center, Bar-Ilan Univ., Israel
2015 **Dept. of Neuroscience and Pharmacology Journal Club** University of Copenhagen Cph, Denmark
2014 **Neural Circuits Controlling Sexual Behavior** (selected "poster blitz" talk), HHMI Janelia, USA
2014 **Barrel Cortex Function** "Developmental, cellular and circuit mechanisms of cortical sensory information processing", Max-Planck-Institute for Experimental Medicine in Göttingen, Germany
2013 **BARRELS XXVI** SfN satellite conference, University of California, San Diego San Diego, USA

Cancelled due to COVID-19:

2020 **NYU Brain Day,** Machine learning tools for analysis of social behavior, (popular science event for general audience, *cancelled*)
2020 **Dept. Of Neuroscience, Univ. of Copenhagen, Denmark,** April 2020 *(cancelled)*

EXCHANGES AND SUMMER SCHOOLS

2021 (canceled) **FENS School on artificial and natural computations for sensory perception**, Betinoro, Italy
2020 **UCL Neuropixels Course**, University College London, UK (conducted online due to COVID-19)
2015 **Okinawa Computational Neuroscience Course**, Okinawa Inst. of Science and Tech, Okinawa, Japan
2013 **BCF/NWG course Analysis and Models in Neurophysiology**, Bernstein Center, Freiburg, Germany
2010-2011 **Humboldt Universität zu Berlin**, ERASMUS Exchange (1 yr.), M.Sc. in Biophysics, Berlin, Germany
2010 **University of California, Santa Barbara**, B.Sc. thesis research and experiments (6 mo.), CA, USA

CONFERENCES

Danish Data Science (2022), **Health Data Science Day** (2023, 2022), **Future of Precision Medicine Symposium** (2022), **Neo4J Graph Summit** (2022), **Society for Neuroscience** (2020, 2019, 2018, 2017, 2016, 2014, 2013), **FENS Brain Conference: Dynamics of the brain: temporal aspects of computation** (2019), **FENS Brain conference: Controlling Neurons, Circuits and Behaviour** (2014), **BARRELS** (2020, 2019, 2018, 2016, 2014, 2013), **NIH BRAIN initiative meeting** (2020, 2019), **Society for Social Neuroscience** (2017), **FENS Forum** (2018, 2016), **COSYNE** (2021). **Barrel Cortex Function** (2016, 2014), **Nordic Neuroscience** (2019, 2017), **Sense to Synapse** (2018), **Young Brain Researchers Conference** (2016), **Cosyne workshops** (2019)**, Bernstein Computational Neuroscience Conference** (2016), **Janelia Conference: Neural Circuits Controlling Sexual Behavior** (2014), **Association for the Study of Animal Behaviour Meeting** (2019),

MENTORING & TEACHING

2023 **Guest lecturer**, course: **Managerial Statistics for Innovation** (MSc in Business Administration and Innovation in Health Care), Copenhagen Business School, Copenhagen, Denmark
2021-Now **External lecturer**, course: **Computational Neuroscience** (M.Sc. in Neuroscience), Dept. of Neuroscience, University of Copenhagen, Copenhagen, Denmark
2012-2017 **Teaching asst.,** course: **Acquisition and Analysis of Neural Data** (M.Sc. in Computational Neuroscience)**,** Bernstein Center for Computational Neuroscience, Berlin
2012-2017 **Teaching asst.,** course: **Animal physiology** (B.Sc. in Biology), Humboldt Universität zu Berlin
2009-2013 **Teaching asst./'Coach', International Physics Olympiad** in Mexico, Thailand, Estonia & Denmark

Extensive experience in **mentoring of junior colleagues**, and **supervision and mentoring of junior postdocs, PhD students and M.Sc. Students** (at Lundbeck A/S, New York University and Humboldt Universität zu Berlin).

OTHER EXPERIENCE AND SERVICE

2022 **Lundbeck's MARS Leadership Program** (Personal Leadership & People Leadership)
2019-2021 **NYU SPiNES Selection Committee** (Seminars by Postdocs in Neuroscience: Extramural Series)
2019-2021 **NYU Neuroscience Postdoc Mentorship Committee** (mentoring and development)
2018 **Chair, organizer and speaker**, Minisymposium, *SfN* Neuroscience Annual Meeting 2018, San Diego
2012 **FELASA B certification**, Federation of European Laboratory Animal Science Associations

Reviewing: Science Advances, Cell Reports, Journal of Neuroscience Methods, Progress in Neurobiology, Journal of Motor Behavior
Memberships: Society for Neuroscience (2013-), New York Academy of Sciences (2017-), Danish Society for Neuroscience (2019-), Association for the Study of Animal Behaviour (2019-)

PUBLICATIONS

BIBLIOMETRIC SUMMARY

Published peer-reviewed publications: 13
First- & co-first authored: 11, Corresponding author: 5
H-index: 12, i10-index: 13 Citations: 696 (Google Scholar, Jul. 2023)

Industry Research

2023 **Ebbesen CL,** Kompus K & Bahl J (2023) Investigating blood biomarkers of psychiatric disease in the "Real World" by data mining and Bayesian hierarchical network modelling. **Society for Neuroscience Meeting** (accepted)

Journal articles

2022 **Ebbesen CL** & Froemke RC (2022) Automatic mapping of multiplexed social receptive fields by deep learning and GPU-accelerated 3D videography. **Nature Communications** 13:593. doi: 10.1038/s41467-022-28153-7 (bioRxiv 2020.05.21.109629. doi: 10.1101/2020.05.21.109629).

2021 **Ebbesen CL** & Froemke RC (2021) Body language signals for rodent social communication. **Current Opinion in Neurobiology** 68:91-106. doi: 10.1016/j.conb.2021.01.008.

2019 **Ebbesen CL**, Bobrov E, Rao RP & Brecht M (2019) Highly structured, partner-sex– and subject-sex-dependent cortical responses during social facial touch. **Nature Communications** 10(1):4634. doi: 10.1038/s41467-019-12511-z. PMID: 31604919 (bioRxiv 545434. doi: 10.1101/545434).

2018 **Ebbesen CL**, Insanally MN, Kopec CD, Murakami M, Saiki A & Erlich JC (2018) More Than Just a “Motor”: Recent Surprises From the Frontal Cortex. **Journal of Neuroscience** 38(44):9402-13. doi: 10.1523/JNEUROSCI.1671-18.2018. PMID: 30381432

↑ Invited review, based on a “mini-symposium” that I organized and chaired at SfN 2018 in San Diego.

2017 **Ebbesen CL** & Brecht M (2017) Motor cortex – to act or not to act? **Nature Reviews Neuroscience**. 18(11):694-705. doi: 10.1038/nrn.2017.119. PMID: 29042690

2017 **Ebbesen CL**, Doron G, Lenschow C & Brecht M (2017) Vibrissa motor cortex activity suppresses contralateral whisking behavior. **Nature Neuroscience**. 20(1):82-89. doi: 10.1038/nn.4437. PMID: 27798633

↑ Previewed by: Kim J & Hires A (2017) Brake and gas pedals in motor cortex. Nature Neuroscience. 20(1):4-6. doi: 10.1038/nn.4461. PMID: 28025981

2016 **Ebbesen CL**, Reifenstein ET, Tang Q, Burgalossi A, Ray S, Schreiber S, Kempter R & Brecht M (2016) Cell Type-Specific Differences in Spike Timing and Spike Shape in the Rat Parasubiculum and Superficial Medial Entorhinal Cortex. **Cell Reports**. 16(4):1005-1015. doi: 10.1016/j.celrep.2016.06.057. PMID: 27425616

2016 Tang[*] Q, Burgalossi[*] A, **Ebbesen[*] CL**, Sanguinetti-Scheck[*] JI, Schmidt H, Tukker JJ, Naumann R, Ray S, Preston-Ferrer P, Schmitz D & Brecht M (2016) Functional Architecture of the Rat Parasubiculum. **Journal of Neuroscience**. 36(7):2289-301. doi: 10.1523/JNEUROSCI.3749-15.2016. PMID: 26888938 **[*] Co-first author**

↑ ”Featured Article”, previewed by: Esch, T (2016) This Week in The Journal: Anatomy and Physiology of Parasubiculum. Journal of Neuroscience. 36(7):i-i.

2016 Reifenstein ET, **Ebbesen CL**, Tang Q, Brecht M, Schreiber S & Kempter R (2016) Cell-Type Specific Phase Precession in Layer II of the Medial Entorhinal Cortex. **Journal of Neuroscience**. 36(7):2283-8. doi: 10.1523/JNEUROSCI.2986-15.2016. PMID: 26888937

2015 Tang Q, **Ebbesen CL**, Sanguinetti-Scheck JI, Preston-Ferrer P, Gundlfinger A, Winterer J, Beed P, Ray S, Naumann R, Schmitz D, Brecht M & Burgalossi A (2015) Anatomical Organization and Spatiotemporal Firing Patterns of Layer 3 Neurons in the Rat Medial Entorhinal Cortex. **Journal of Neuroscience**. 35(36):12346-54. doi: 10.1523/JNEUROSCI.0696-15.2015. PMID: 26354904

2014 Tang[*] Q, Burgalossi[*] A, **Ebbesen[*] CL**, Ray S, Naumann R, Schmidt H, Spicher D & Brecht M (2014) Pyramidal and stellate cell specificity of grid and border representations in layer 2 of medial entorhinal cortex. **Neuron**. 84(6):1191-7. doi: 10.1016/j.neuron.2014.11.009. PMID: 25482025 **[*] Co-first author**

↑ Previewed by: Savelli F & Knierim JJ (2014) Strides toward a Structure-Function Understanding of Cortical Representations of Allocentric Space. Neuron. 84(6):1108-1109. doi: 10.1016/j.neuron.2014.12.013. PMID: 25521370

2012 **Ebbesen CL** & Bruus H. (2012) Analysis of laser-induced heating in optical neuronal guidance. **Journal of Neuroscience Methods.** 209(1):168-77. doi: 10.1016/j.jneumeth.2012.02.006. PMID: 22387314

2012 Adams[*] JD, **Ebbesen[*] CL**, Barnkob R, Yang AHJ, Soh HT & Bruus H (2012) High-throughput, temperature-controlled microchannel acoustophoresis device made with rapid prototyping. **Journal of Micromechanics and Microengineering**. 22(7): 075017 **[*] Co-first author**

Peer-reviewed conference proceedings

2019 Schwartzberg L, Papadoyannis E, Talbot J, **Ebbesen CL**, Littman DR, Froemke RC (2019) Sickness Behavior and Gut-Brain Signaling Via Vagus Nerve in Infected Mice. **Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation.** 12(2)e4:10 doi: 10.1016/j.brs.2018.12.017

2010 **Ebbesen CL**, Adams JD, Barnkob R, Soh HT & Bruus H (2010) Temperature-controlled high-throughput (1 L/h) acoustophoretic particle separation in microchannels. **Proc 14th MicroTAS**, 3-7

Doctoral thesis

2018 **Ebbesen CL** (2018) Cortical circuits underlying social and spatial exploration in rats. **Humboldt-Universität zu Berlin, Lebenswissenschaftliche Fakultät**. doi: 10.18452/19231

Popular science and commentary

2020 **Ebbesen CL** (2020) Flawed estimates of cognitive ability in Clark et al. Psychological Science, 2020. **PsyArXiv** 2020.06.17. doi:10.31234/osf.io/tzr8c.

↑ A submitted comment on a paper that used flawed IQ data to make claims of “cognitive disadvantage” of non-white populations. My critique – and other critiques – forced the editors/authors to retract the flawed paper.

2019 **Ebbesen CL** (2019) Det er lige så biologisk korrekt at sige 'hen' som at sige 'rødhåret'. [The use of gender neutral pronouns does not conflict with biological science.] **Dagbladet Information** [Danish national newspaper], 21. October 2019, pp. 16-17

↑ Associated interview on national public radio: Hjerneforsker kritiserer Berlingskes chefredaktør for at "vrøvle", når hun siger, at der kun findes to køn. [Interview about the neuroscience of sex and gender.] **Radio24syv** [National Danish public–service radio station], kulturprogrammet AK24syv, 15. October 2019, 18:40–19:00.