

# H. Freyja Ólafsdóttir



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## Employment

**Donders Centre for Neuroscience, Radboud University (Department of Neurophysiology) (December 2018 - present).** *Assistant Professor tenure track (Donders Mohrmann fellowship).*

- Principal investigator of research group aiming to elucidate the neural mechanisms supporting the maturation of episodic/spatial memory, using chronic *in vivo* electrophysiology, optogenetics, chemogenetics and behavioural testing in pre-weanling and adult rodents rodents.
- Funding from Donders Mohrmann Fellowship (400,000EUR)
- Organiser of international meetings and conferences which bring together expert and influential researchers from a broad range of backgrounds
- Supervisor of research students
- Academic community support: member of Donders Equality and Diversity Committee, ambassador for *eLife* promoting fair funding practices in science, provide regular peer-review to journals, examiner of PhD theses.

**UCL, Cell and Developmental Biology (2014 – 2018)** *Research associate in the lab of Dr. Caswell Barry*

- Conducted and published high impact research in the field of *in vivo* electrophysiology (e.g. Olafsdottir et al. (2016). *Nature Neuroscience*; Olafsdottir et al.(2017). *Neuron*). Carried out dual recordings from the hippocampus and entorhinal cortex, used optogenetics to disrupt communication between hippocampus and entorhinal cortex during rest.
- Setup hardware and software for carrying out optogenetics and openEphys recording – a system for carrying out electrophysiological experiments.
- Presented work at international and local conferences in the form of posters and invited talks. Presented at various journal clubs.
- Co-supervised graduate students in the lab and lectured on graduate courses.
- Mentored A-level students from disadvantaged backgrounds during summer placements (2016,2017)
- Engaged with public and media, communicated important findings to print and radio journalists

**UCL, Division of Psychology and Language Sciences (2010 – 2014)** *Chief statistical demonstrator for undergraduate and postgraduate statistics*

- Taught statistics to undergraduate and graduate students during problem tutorials
- Prepared worksheets and lessons for graduate statistical classes.
- Marked coursework and exam scripts.

## Education

**UCL, Cognitive, Perceptual and Brain Sciences (2010-2014)** *Ph.D. Candidate Behavioural Neuroscience, supervisors Dr. Hugo Spiers and Dr. Francesca Cacucci*

- Conducted and published high impact research in the field of *in vivo* electrophysiology. Carried out large-scale recording of hippocampal place cells (Olafsdottir, Barry et al. (2015) *eLife*).
- Carried out *in vivo* two photon calcium imaging in head-fixed mice and developed a technique to ablate single cells to enable perturbation of functional micro-circuits in the brain (during a 6-month placement in Dr. Karel Svoboda's laboratory at Janelia Research Campus).
- Co-supervised undergraduate and graduate students.

- Mentored A-level students from disadvantaged backgrounds during summer placements (2011,2012).
- Presented work at international and national conferences and meetings in the form of posters or invited talks. Presented peer-reviewed papers at journal clubs

**UCL, Division of Psychology and Language Sciences (2007-2010) BSc. Psychology, 1<sup>st</sup> class with honours.1<sup>st</sup> class. Research project on novelty processing in scenes, supervisor Dr. Hugo Spiers**

## Publications

- Tampuu A, Matiisen T, **Ólafsdóttir HF**, Barry C, Vicente R (2019). Efficient neural decoding of spatial location with a deep recurrent network. *PLoS Computational Biology*, 15(2):e1006822.
- **Ólafsdóttir HF**, Bush D, Barry C (2018). The Role of Replay in Memory and Planning. *Current biology*, 28(1):R37-50.
- **Ólafsdóttir HF**, Carpenter F, Barry C (2017). Task Demands Predict a Dynamic Switch in the Content of Awake Hippocampal Replay. *Neuron*, 96(4):925-35, e6.
- Spiers, HJ\*, **Ólafsdóttir HF\***, Lever, C (2017). Hippocampal CA1 Activity Correlated with the Distance to the Goal and Navigation Performance. *Hippocampus*
- **Ólafsdóttir HF**, Carpenter F, Barry C (2016). Coordinated Grid and Place Cell Replay during Rest. *Nature Neuroscience*, 19(6):792-4.
- **Ólafsdóttir HF**, Barry C (2015). Spatial Cognition: Grid Cell Firing Depends on Self-Motion Cues (Dispatch). *Current Biology*, 25(19): R827-R829.
- **Ólafsdóttir HF\***, Barry C\*, Saleem AB, Hassabis D, Spiers HS (2015). Hippocampal Place Cells Construct Reward Related Sequences through Unexplored Space. *eLife*, 4:e06063.
- Howard LR, Kumaran D, **Ólafsdóttir HF**, Spiers HJ (2013). Dissociation between Dorsal and Ventral Posterior Parietal Cortical Responses to Incidental Changes in Natural Scenes. *PLoS One*. 9;8(7).
- Howard LR, Kumaran D, **Ólafsdóttir HF**, Spiers HJ (2011). Double Dissociation between Hippocampal and Parahippocampal Responses to Object-Background Context and Scene Novelty. *Journal of Neuroscience*, 31(14):5253-61.

## Publications in preparation/pre-prints

- Peron S, Wittenbach JS, **Ólafsdóttir HF**, Freeman J, Svoboda K (in preparation). Recurrent Interactions in Local Cortical Circuits during Behaviour.

## Non-academic publications

- **Ólafsdóttir HF** (2016). The Navigational System of the Brain. *Serious Science*
- **Ólafsdóttir HF** (2015). Do Animals Think about the Future? *Aeon Magazine*.
- **Ólafsdóttir HF** (2015). The Brain Simulates Paths to a Brighter Future. *Serious Science*.
- Knowles RL, **Ólafsdóttir HF** (2013) Initial Clinical Referral Standards after Newborn Screening for Congenital Hypothyroidism: Final Report of the UK Newborn Screening.
- Numerous reviews for Faculty of 1000.

\*denotes joint first authorship.

## Awards/Studentships

- Donders Mohrmann fellowship (2018) to start own research group (400,000EUR)
- Guarantors of Brain conference grant (2017) for an international meeting on grid cell research.
- Guarantors of Brain travel grant (2013, 2016)
- Bogue Research Fellowship to learn in-vivo two-photon imaging in Dr. K. Svoboda's laboratory at Janelia Research Campus (2013).
- UCL Graduate School travel grant (2013).
- UCL Psychology Funded Demonstratorship (2010)
- A MRC funded prize studentship in the Epidemiology and Biostatistics department at the Institute of Child Health, UCL (summer 2009 and 2010).
- Dean's List Award for outstanding academic achievement (given to students obtaining the top 10% marks in the faculty of life sciences) (2009)

## Meetings Organised

- Symposium organiser of 'Grid Cells Beyond Self Location' at the festival of neuroscience (British Neuroscience Association, Dublin 2019)

- Co-organiser of 'Grid Cells for Space and Beyond' (London, 2017). International conference jointly funded by Wellcome Trust, Gatsby Charitable Foundation, Guarantors of Brain, *eLife* and DeepMind.
- Session organiser and speaker: Spring Hippocampal Research Conference (Sicily, 2017).
- Organised a workshop on peer-review and diversity in science for a lab retreat (Cumberland Lodge, Windsor, 2017)

## Invited talks

- Spring hippocampal research conference (Sicily, June 2019)
- Fritz Thyssen workshop on 'Sleep for memory - current challenges and future directions' (Berlin, 2019)
- External speaker at Academic Neurology Meeting (Royal Free Hospital, London 2019).
- External seminar speaker at INMED (Marseille, 2018)
- TEX2018 M-GATE School: Under the Surface of Memory Phenomena (Sissa) (2018)
- Institute of Science and Technology Austria, hosted by Dr.Jozsef Csicsvari (2017).
- Cell and Developmental Biology Departmental Seminar (UCL, 2017)
- Spring Hippocampal Research Conference (2017)
- The Brain Meeting, Wellcome Trust Centre for Neuroimaging (UCL) (2017)
- International Conference on Memory (ICOM, 2016).
- iNav: interdisciplinary conference on navigation (2016).
- Institute of Behavioural Neuroscience, UCL (2016)
- Spring Hippocampal Research Conference (2013)
- Janelia Research Campus, hosted by Dr.Karel Svoboda (2013)
- John Hopkins University, hosted by Prof. David Foster (2017).
- Lost-in-space interdisciplinary workshop, UCL (2010)

## Posters and abstracts

- Society for Neuroscience (November, 2018). The temporal evolution of grid-place cell replay coordination
- Royal Society Frontiers of Science (2018). The Role of Hippocampal Replay in Memory and Planning.
- FENS Regional Meeting (Pecs, 2017). Task Demands Predict a Dynamic Switch in the Content of Awake Hippocampal Replay.
- Theo Murphy International Scientific Meeting (2017). Coordinated Grid and Place Cell Replay.
- Society for Neuroscience (2016). Coordinated Grid and Place Cell Replay.
- UCL Neuroscience Symposium (2016). Coordinated Grid and Place Cell Replay during Rest.
- UCL Faculty of Life Sciences Research Day (2016). Coordinated Grid and Place Cell Replay during Rest.
- Janelia Hippocampal-Entorhinal Complexities Conference (2015). Coherent Grid and Place Cell Replay during Rest.
- Society for Neuroscience (2014). Hippocampal Preplay is Modulated by the Behavioural Relevance of Seen yet Unvisited Environments.
- Theo Murphy International Scientific Meeting (2013). Desired goals drive construction of future routes in the hippocampus during sleep.
- UCL Postgraduate Poster Symposium (2013). Desired goals drive construction of future routes in the hippocampus during sleep

## Public engagement

- *eLife* ambassador for 2018. Responsibilities: interface between my local research environment and the *eLife* Early-Career Advisory Group (ECAG) to promote diversity, equality and fairness in science, with a particular focus on fair funding practices. For example, I conducted a survey assessing experiences of researchers who had children during their postdoc. This formed a part of white paper on fair practices in scientific funding and a blog post will online summarising the findings obtained.
- in2scienceUK ambassador: ambassador for an award-winning UK charity which empowers young students from disadvantaged backgrounds to fulfil their potential and progress to a STEM subject at university and a career in research. Roles include promotion of charity and interviewing students for summer lab placements.
- Radio interview with the BBC World Service Science in Action programme and Radio Wolfgang (2015) about the results of *eLife* paper.

- eLife paper was covered by the BBC Magazine Monitor, New Scientist, Discover Magazine, National Geographic, Scholastic Science World, QI podcast and Huffington Post, to name a few.
- Nature Neuroscience paper was covered by the Mail Online, Huffington Post, The Times of India and ALN Magazine, and others.
- In2scienceUK mentor: hosted summer lab placements for A-level students from disadvantaged backgrounds (2011,2012,2016-218).

## **References**

Available on request