

# Robin Hayman

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## EMPLOYMENT

- 2014–present **Senior Research Fellow**, *Department of Clinical & Experimental Epilepsy, Institute of Neurology, University College London, London.*  
Senior post-doctoral research fellow with Neil Burgess
- Based in John O’Keefe’s lab in Anatomy developing chronic in-vivo neural recordings and optogenetics
  - Using genetically modified mice to elucidate role of interneurons in spatial processing
  - Developed analysis tools in C++ for examining electrophysiological data and, separately, two-photon calcium imaging data recorded in rodent virtual reality
  - Imaging neural tissue using immunohistochemistry
- 2010–2014 **Teaching Fellow in Neuroscience**, *Cognitive, Perceptual & Brain Sciences, University College London, London.*  
Course co-organiser of MSc in Neuroscience at UCL
- Created two additional modules (Systems & Circuits Neuroscience and Cognitive Neuroscience) for the MSc in Neuroscience at UCL
  - Regular lectures and small group seminars/ journal clubs to post-graduate students
  - Liaising with ~40 PI’s across UCL to teach on the course
  - Creating/ marking exam questions and in-course assignments
  - Personal tutor to ~25 undergraduate and postgraduate students every year
  - Participating in teaching and examination board meetings
  - Simultaneously performed the duties of senior post-doctoral researcher in the lab of Prof Kate Jeffery (see below for specific roles)
- 2006–2010 **Research Fellow in Neuroscience**, *Department of Psychology, University College London, London.*  
Senior post-doctoral research fellow with Prof Kate Jeffery
- Conducted and published high-impact research in the field of electrophysiology (long-term single unit recordings from freely moving animals) and behavioural and computational neuroscience
  - Presented results at academic meetings in the form of posters and invited talks
  - Lectured on 2<sup>nd</sup> and 3<sup>rd</sup> year undergraduate Psychology courses
  - Organised and participated in journal clubs
  - Day-to-day supervision of several PhD students, several MSc students and many undergraduate students
  - Laboratory demonstrator: demonstrated techniques, assisted running of practical classes and marked reports
  - Funded by BBSRC & Wellcome Trust
- 2005–2006 **Postdoctoral Researcher**, *Department of Neuroscience, University of Oregon, Eugene, Oregon, USA.*  
Junior post-doctoral researcher with Dr Cliff Kentros
- Implementation of novel place-preference behavioural task in mice
  - Setting up and running *in vivo* electrophysiological experiments in mice
  - Supervision of PhD student
  - Funded by NIH & University of Oregon

2004–2005 **Postdoctoral Researcher**, *Department of Psychology, University College London, London.*

Junior post-doctoral researcher with Dr Kate Jeffery

- Running and analysing behavioural and chronic single neuron recording experiments in rats
- Supervision of PhD student
- Funded by BBSRC

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## EDUCATION

2001–2004 **PhD in Psychology (competitively awarded BBSRC studentship)**, *Department of Psychology, University College London, London, Supervisor Dr Kate Jeffery.*

In vivo electrophysiological investigation of sensory inputs to hippocampal place cells in freely behaving animals.

2000–2001 **MSc in Neuroscience**, *Department of Anatomy & Developmental Biology, University College London, London.*

Context-specific location discrimination of hippocampal place cells

1999–2000 **BSc in Neuroscience (2<sup>nd</sup> year)**, *Department of Anatomy & Developmental Biology, University College London, London.*

1995–1998 **BSc in Psychology**, *Department of Psychology, University of Staffordshire, Stoke-on-Trent.*

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## PEER-REVIEWED PUBLICATIONS

K Jeffery, JJ Wilson, G Casali, **R Hayman** (2015). Neural encoding of large-scale three-dimensional space - properties and constraints. *Frontiers in Psychology*, 14(6):927

**R Hayman**, G Casali, JJ Wilson & K Jeffery (2015). Grid cells on steeply sloping terrain: evidence for planar rather than volumetric encoding. *Frontiers in Psychology*, 15(6):925

H Spiers<sup>‡</sup>, **R Hayman**<sup>‡</sup>, A Jovalekic, E Marozzi & K Jeffery (2015). Place field repetition and purely local remapping in a multi-compartment environment. *Cerebral Cortex*, 25(1):10-25. <sup>‡</sup>**Joint first authors**

K Jeffery, A Jovalekic, M Verriotis & **R Hayman** (2013). Navigating in a 3D world. *Behavioral & Brain Sciences*, 36(5):523-43

K Yoon, M Buice, C Barry, **R Hayman**, N Burgess & I Fiete (2013). Evidence of low-dimensional continuous attractor dynamics in grid cells. *Nature Neuroscience*, 16(8):1077-84

R Knight, **R Hayman**, LL Ginzberg, KJ Jeffery (2011). Geometric cues influence head direction cells only weakly in non-disoriented rats. *Journal of Neuroscience*, 31(44):15681-92

**R Hayman**, M Verriotis, A Jovalekic, A Fenton, & K Jeffery (2011). Anisotropic encoding of three-dimensional space by place cells and grid cells. *Nature Neuroscience*, 14(9):1182-8

A Jovalekic, **R Hayman**, N Becares, H Reid, G Thomas, J Wilson & K Jeffery (2011). Horizontal biases in rats' use of three-dimensional space. *Behavioural Brain Research*, 222(2):279-88

**R Hayman** & K Jeffery (2008). How heterogeneous place cell responding arises from homogeneous grids – a contextual gating hypothesis. *Hippocampus*, 18(12):1301–13

**R Hayman**, J G Donnett, & K Jeffery (2008). The fuzzy-boundary arena—a method for constraining an animal's range in spatial experiments without using walls. *Journal of Neuroscience Methods*, 167(2):184–90

C Barry, **R Hayman**, N Burgess, & K Jeffery (2007). Experience-dependent rescaling of entorhinal grids. *Nature Neuroscience*, 10(6):682-4

C Barry, C Lever, **R Hayman**, T Hartley, S Burton, J O'Keefe, K Jeffery, N Burgess (2006). The boundary vector cell model of place cell firing and spatial memory. *Reviews in Neuroscience*, 17(1-2):71-97

K Jeffery, M I Anderson, **R Hayman**, & S Chakraborty (2004). A proposed architecture for the neural representation of spatial context. *Neuroscience & Biobehavioural Reviews*, 28(2):201-18

K Jeffery and **R Hayman** (2004). Plasticity of the hippocampal place cell representation. *Reviews in Neuroscience*, 15(5):309-31

**R Hayman**, S Chakraborty, M I Anderson, & K Jeffery (2003). Context-specific acquisition of location discrimination by hippocampal place cells. *European Journal of Neuroscience*, 18(10):2825-34

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## PREVIEWS, ABSTRACTS, BOOK CHAPTERS & INVITED TALKS

**R Hayman** & N Burgess (2016). Disrupting the grid cells' need for speed. *Neuron*, 91(3):502-3

**R Hayman** & N Burgess (2015). How cumulative error in grid cell firing is literally bounded by the environment. *Neuron*, 86(3):607-9

**R Hayman** & N Burgess (2014). Are new place representations independent of theta and path integration? *Neuron*, 82(4):721-2

Invited talk at Royal Holloway University, February, 2009. The three-dimensional representation of space by the brain.

Invited talk at The University of Manchester, January, 2008. The three-dimensional representation of space by the brain.

**R Hayman**, M Verriotes, & K Jeffery (2008). Three dimensional response properties of entorhinal grid cells. Abstract 128.12. 6th Forum of European Neurosciences

K Jeffery, M I Anderson, **R Hayman**, & S Chakraborty (2003). Hippocampal cognitive mapping system in rats and relation to human spatial behaviour. C.G. Lipinski (Ed), *Hippokampus - Grundlagen und Klinik*. Bad Honnef: Hippocampus-Verlag.

M I Anderson, **R Hayman**, S Chakraborty, & K Jeffery (2003). The representation of spatial context. In: *The Neurobiology of Spatial behaviour*, Jeffery, K. J. (Ed), Oxford University Press, Oxford.

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## COMPUTER SKILLS

Hardware	Axona High Density Electrophysiological recording and analysis system Neuralynx High Density Electrophysiological recording and analysis system
Software	Computer Languages: C/C++ (Intermediate->Advanced), Matlab (Advanced), Python (Intermediate->Advanced) & Java (Intermediate) Operating Systems: Windows & Unix

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## INTERESTS

Football	I play every week in a 7-a-side league with the UCL Psychology football team
Running	I train regularly (4-6 times a week) and compete several times a year in races
Origami	I make highly complex origami models from paper I prepare myself and have recently started designing my own models. A complex model may take several days to complete

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## REFERENCES

Available on request