

DR. ALEXANDER SHAKEEL BATES

I am a neuroscientist and programmer on open-source projects. I work on insect brains. I am interested in how neurons wire together, and how they work together to build complex, innate behaviours. D.O.B. 23/09/1993.

total cites h index i10 index peer reviews



PROFESSIONAL RESEARCH

present
|
01/10/2020

- Postdoctoral Fellow in Neurobiology ↗
Harvard Medical School 📍 Boston, US
- Member of the laboratory of Prof. Rachel Wilson ↗
- Working on navigational circuitry, using calcium imaging, neurophysiology and behavioural studies involving virtual reality with *D. melanogaster*
- Helping to lead an international collaboration with Prof. Wei-Chung Allen Lee ↗, flywire ↗ and a set of international groups on the first whole fly central nervous system connectome, open-access

01/03/2024
|
01/10/2020

- Visiting Scientist
Dept. Zoology, University of Cambridge 📍 remote
- Neuroinformatics work with the Drosophila Connectomics Group ↗
- Developed R tools for neuroanatomy and connectomics, organised international collaborators

FELLOWSHIPS

01/06/2025
|
01/06/2022

- Sir Henry Wellcome Fellowship ↗
Wellcome Trust & University of Oxford 📍 UK
- 30,000 GBP towards my current research
- Collaboration between groups of Rachel Wilson, Wei Lee, Scott Waddell and Shaul Druckmann
- Also accepted as Life Science Research Foundation fellow

01/06/2022
|
01/04/2021

- EMBO fellow ↗
European Molecular Biology Organization 📍 Europe
- Also accepted as a International Human Frontier Science Program fellow

30/09/2019
|
01/08/2015

- Herchel Smith PhD Scholarship ↗
Herchel Smith Foundation 📍 Cambridge, UK

01/08/2018
|
01/08/2016

- Boehringer Ingelheim PhD Scholarship ↗
Boehringer Ingelheim Foundation 📍 European

Media

- ✉ alexander_bates @hms.harvard.edu ↗
- ☁ @asbates.bsky.social ↗
- 🐦 as_bates ↗
- 👤 alexanderbates ↗
- 🔗 asbates.com ↗
- 👤 linkedIn ↗
- 🔗 google scholar ↗
- >ID 0000-0002-1195-0445 ↗
- R⁺ researchgate ↗
- P GQQ-6852-2022 ↗

Skills

- ⌚ R
- ⌚ python
- ⌚ MATLAB
- ⌚ github
- ⌚ git
- ⌚ markdown
- ⌚ Illustrator
- ⌚ InDesign
- ⌚ communication
- ⌚ text editing
- ⌚ journalistic writing
- ⌚ creative writing
- ⌚ open access

Software

- ⌚ natverse ↗
- ⌚ neuromorphr ↗
- ⌚ neuronbridger ↗
- ⌚ neuprintr ↗
- ⌚ hemibrainr ↗
- ⌚ mouselightr ↗
- ⌚ insectbrainr ↗
- ⌚ crantr ↗
- ⌚ bancr ↗

Referees

- 👤 PhD Supervisor:
Dr. Gregory Jefferis, MRC Laboratory of Molecular Biology, Cambridge, jefferis@mrc-lmb.cam.ac.uk ↗
- 👤 Current Supervisor:
Prof. Rachel Wilson, Harvard Medical School, Rachel_Wilson@hms.harvard.edu ↗
- 👤 BSc Tutor at UCL:
Dr. Marco Beato, UCL Neuroscience, Physiology and Pharmacology, m.beato@ucl.ac.uk ↗
- 👤 Supervisee: Serene Dhawan, Princeton, PhD student, serenedhawan@gmail.com ↗

EDUCATION

30/09/2020
|
01/09/2015

- Neuroscience PhD
MRC LMB ↗, University of Cambridge 📍 Cambridge, UK
- PhD student with Dr. Greg Jefferis ↗
- Thesis ↗: The lateral horn, a brain region in the fly, primes innate olfactory behaviours by combining patterns of second-order olfactory projection neuron activity. In my work, I developed tools and analyses, and reconstructed neural networks from electron microscopy data, in order to better understand this brain region and how memory systems interact with it
- Neuroinformatics, data science, R programming
- Awards: Honorary Vice Chancellor's Award ↗, MRC LMB Max Perutz Prize 2019 ↗, Winner of the British Neuroscience Association Postgraduate Prize 2020 ↗

01/07/2015
|
01/09/2012

- Neuroscience BSc
University College London 📍 London, UK
- 1st class degree with honours
- Modules taken listed on linkedIn ↗
- Awards: Burnstock Sessional Prize in Neuroscience BSc ↗ (ranked first in year) (2012–2013) (2013–2014) (2014–2015), Dean's list for the Faculty of Life Sciences (2013–2014) (2014–2015), Rob Clarke Award ↗ from the Society of Physiology

REVIEWS

	title	author	journal	year	cites
Systems neuroscience: Auditory processing at synaptic resolution ↗	AS Bates , G Jefferis		Curr. Biology	2022	1
Neuronal cell types in the fly: single-cell anatomy meets single-cell genomics ↗	AS Bates , J Janssens, GS Jefferis, S Aerts		Curr. opinion in neurobiology	2019	65

PAPERS

Publication table displays first six authors, my name in bold, underlining indicates first (co-)authorship

title	author	journal	year	cites
Neurotransmitter classification from electron microscopy images at synaptic sites in <i>Drosophila melanogaster</i>	N Eckstein, AS Bates, A Champion, M Du, YYin, P Schlegel, AKY Lu, ...	Cell	2024	138
Information flow, cell types and stereotypy in a full olfactory connectome	P Schlegel, AS Bates, T Stürner, SR Jagannathan, N Drummond, J Hsu, ...	Elife	2021	124
Complete connectomic reconstruction of olfactory projection neurons in the fly brain	AS Bates, P Schlegel, RJV Roberts, N Drummond, IFM Tamimi, ...	Curr. Biology	2020	179
The natverse, a versatile toolbox for combining and analysing neuroanatomical data	AS Bates, JD Manton, SR Jagannathan, M Costa, P Schlegel, T Rohlfing, ...	Elife	2020	173
Analysis and optimization of equitable US cancer clinical trial center access by travel time	H Lee, AS Bates, S Callier, M Chan, N Chambwe, A Marshall, MB Terry, ...	JAMA oncology	2024	8
Analysis and optimization of equitable US cancer clinical trial center access by travel time.	H Lee, A Bates, A Marshall, S Callier, N Chambwe, T Janowitz	J. of Clinical Oncology	2023	0
Analysis of methods to improve engagement of under-represented and socioeconomically deprived patients in clinical research	H Lee, AS Bates, R Dima, S Nadella, N Jordan-Martin, C Brennan, ...	Cancer Res.	2022	0
Functional and anatomical specificity in a higher olfactory centre	S Frechter, AS Bates, S Tootoonian, MJ Dolan, J Manton, AR Jamasb, ...	eLife	2019	105
Whole-brain annotation and multi-connectome cell typing of <i>Drosophila</i>	P Schlegel, YYin, AS Bates, S Dorkenwald, K Eichler, P Brooks, DS Han, ...	Nature	2024	152
Quantitative Attributions with Counterfactuals	DY Adjavon, N Eckstein, AS Bates, GSXE Jefferis, J Funke	bioRxiv	2024	0
Discriminative attribution from paired images	N Eckstein, H Bukhari, AS Bates, GSXE Jefferis, J Funke	Euro. Conf. on Computer Vision	2022	7
BACTrace, a tool for retrograde tracing of neuronal circuits in <i>Drosophila</i>	S Cachero, M Gkantia, AS Bates, S Frechter, L Blackie, A McCarthy, ...	Nature methods	2020	35
Neural circuit mechanisms for steering control in walking <i>Drosophila</i>	A Rayshubskiy, SL Holtz, A Bates, QX Vanderbeck, LS Capdevila, ...	bioRxiv	2020	68
BACTrace a new tool for retrograde tracing of neuronal circuits	S Cachero, M Gkantia, AS Bates, S Frechter, L Blackie, A McCarthy, ...	bioRxiv	2020	6
Neurogenetic dissection of the <i>Drosophila</i> lateral horn reveals major outputs, diverse behavioural functions, and interactions with the mushroom body	MJ Dolan, S Frechter, AS Bates, C Dan, P Huoviala, RJ Roberts, ...	Elife	2019	158
Communication from learned to innate olfactory processing centers is required for memory retrieval in <i>Drosophila</i>	MJ Dolan, G Belliard-Guérin, AS Bates, S Frechter, A Lampin-Saint-Amaux, ...	Neuron	2018	112
Automated reconstruction of a serial-section EM <i>Drosophila</i> brain with flood-filling networks and local realignment	PH Li, LF Lindsey, M Januszewski, Z Zheng, AS Bates, I Taisz, M Tyka, ...	bioRxiv	2019	98
A <i>Drosophila</i> computational brain model reveals sensorimotor processing	PK Shiu, GR Sterne, N Spiller, R Franconville, A Sandoval, J Zhou, ...	Nature	2024	33
Network statistics of the whole-brain connectome of <i>Drosophila</i>	A Lin, R Yang, S Dorkenwald, A Matsliah, AR Sterling, P Schlegel, S Yu, ...	Nature	2024	53
Neuronal wiring diagram of an adult brain	S Dorkenwald, A Matsliah, AR Sterling, P Schlegel, SC Yu, CE McKellar, ...	Nature	2024	218
Comparative connectomics of the descending and ascending neurons of the <i>Drosophila</i> nervous system: stereotypy and sexual dimorphism	T Stürner, P Brooks, LS Capdevila, BJ Morris, A Javier, S Fang, M Gkantia, ...	bioRxiv	2024	9
The connectome of the adult <i>Drosophila</i> mushroom body provides insights into function	F Li, JW Lindsey, EC Marin, N Otto, M Dreher, G Dempsey, I Stark, ...	Elife	2020	336
A connectome and analysis of the adult <i>Drosophila</i> central brain	LK Scheffer, CS Xu, M Januszewski, Z Lu, S Takemura, KJ Hayworth, ...	Elife	2020	955
Connectomics analysis reveals first-, second-, and third-order thermosensory and hygrosensory neurons in the adult <i>Drosophila</i> brain	EC Marin, L Büld, M Theiss, T Sarkissian, RJV Roberts, R Turnbull, ...	Curr. Biology	2020	94
Input connectivity reveals additional heterogeneity of dopaminergic reinforcement in <i>Drosophila</i>	N Otto, MW Pleijzier, IC Morgan, AJ Edmondson-Stait, KJ Heinz, I Stark, ...	Curr. Biology	2020	73
Neural circuit basis of aversive odour processing in <i>Drosophila</i> from sensory input to descending output	P Huoviala, MJ Dolan, FM Love, P Myers, S Frechter, S Namiki, ...	bioRxiv	2018	44
Combinatorial encoding of odors in the mosquito antennal lobe	P Singh, S Goyal, S Gupta, S Garg, A Tiwari, V Rajput, AS Bates, ...	Nature Comm.	2023	11

SELECTED TALKS

- 2019
 - ECRO meeting
European Chemoreception Research Organization 📍 Trieste, Italy
- 2018
 - Boehringer Ingelheim Meeting
Boehringer Ingelheim Fonds 📍 Hirschegg, Austria
- 2017
 - MPI Connectomics meeting
Max Planck Institute 📍 Berlin, Germany
 - ECRO meeting
European Chemoreception Research Organization 📍 Cambridge, UK
- 2017
 - Boehringer Ingelheim Meeting
Boehringer Ingelheim Fonds 📍 Hirschegg, Austria
- 2016
 - Brains and Roses
Schaeffer and Datta group organised 📍 Montserrat, Catalonia

SELECTED POSTERS

- 2023
 - HHMI Investigators' Meeting
HHMI HQ 📍 Chevy Chase
- 2019
 - UK Neural Computation
University of Nottingham 📍 Nottingham, UK

2017	Boehringer Ingelheim Fonds communication workshop Boehringer Ingelheim Foundation	 Mainz, Germany
2016	Maggot Meeting Janelia Research Campus	 Ashburn, US
2016	High-resolution circuit reconstruction meeting Janelia Research Campus	 Ashburn, US
2016	LMB GSA Symposium MRC LMB, University of Cambridge	 Cambridge, UK

LEADERSHIP

01/10/2019	President of BlueSci ↗ University College London	 London, UK
01/01/2016	· Lead BlueSci ↗, the University of Cambridge's science media society, through 15 issues of the magazine ↗	
2018	Mentored summer student MRC LMB, University of Cambridge	 Cambridge, UK
01/05/2018	Mentored undergraduate student Dept. Zoology, University of Cambridge	 Cambridge, UK
01/09/2017	· Student won best thesis in year award and two authorships	
2017	Mentored summer student MRC LMB, University of Cambridge	 Cambridge, UK
2017	LMB graduate symposium lead organiser ↗ MRC LMB, University of Cambridge	 Cambridge, UK
2016	LMB graduate symposium organiser ↗ MRC LMB, University of Cambridge	 Cambridge, UK
01/10/2015	President of the UCLU Writer's Society ↗ University College London	 London, UK
01/10/2014		
01/10/2015	Science Editor, Pi Magazine ↗ University College London	 London, UK
01/10/2014		
2014	UCL iGEM 2014 ↗ Advisor University College London	 London, UK
	· Project planning, oversight, team selection and management	
	· Gold medallist	

OTHER

2019	Visiting Scholar Janelia Research Campus	 Ashburn, US
	· Worked in FlyEM, Dr. Gerry Rubin's Group ↗	
	· Worked on the hemibrain connectome	
2018	Paris Spring School in Neuroscience Techniques Paris Descartes University	 Paris, France
	· A course in ↗ Optical Imaging and Electrophysiological Recording in Neuroscience	
2016	Visiting Scholar Janelia Research Campus	 Ashburn, US
	· Worked with Dr. Albert Cardona's Group ↗	
	· Worked on the L1 larval connectome	
2015	University of Queensland Winter Scholarship University of Queensland	 Brisbane, Australia
	· Worked on tectal activity in zebrafish larvae, light sheet imaging, Dr. Ethan Scott's Group ↗	
2014	Amgen Scholarship ↗ Dept. Zoology, University of Cambridge	 Cambridge, UK
	· Worked on neuronal structural plasticity in D. melanogaster larvae, Dr. Landgraf's group ↗	
2013	UCL iGEM 2013 ↗ team member University College London	 London, UK
	· Team member, cloning, cell culture, project planning	
	· Gold medallist	

2013

- Summer student in the biomolecular modelling laboratory
Cancer Research UK, London Research Institute
 - Student Placement with Dr. Tammy Cheng , python programming

 London, UK

PEER REVIEWS

journal reviews

PLoS Comp. Bio.	3
eLife	3
Nature Comm.	1

Updated on DD-MM-YYYY