

# 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. Alive since **23/09/1993**.

total\_cites h\_index i10\_index



## PROFESSIONAL RESEARCH

present  
|  
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

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*



## GRANTS

present  
|  
01/04/2021

### EMBO fellow

European Molecular Biology Organization

📍 European

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

2021

### Life Science Research Foundation Fellowship

Life Science Research Foundation

📍 US

- Gratefully declined

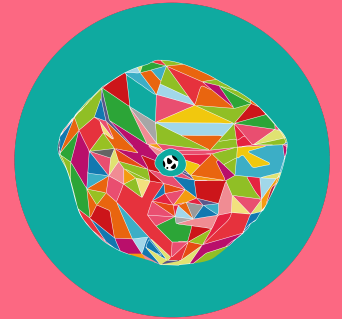
2021

### Human Frontiers Fellowship

International Human Frontier Science Program

📍 International

- Gratefully declined



📄 download this resume

## MEDIA



[Alexander\\_Bates@hms.harvard.edu](mailto:Alexander_Bates@hms.harvard.edu)

🐦 [as\\_bates](#)

👤 [alexanderbates](#)

🔗 [asbates.com](#)

in [LinkedIn](#)

🔍 [google scholar](#)

🆔 0000-0002-1195-0445

🔬 [researchgate](#)

## SOFTWARE

🔧 [natverse](#) - a toolscape for neuroinformatics, co-author

✂️ [neuromorphr](#) - author



✂️ [neuronbridger](#) - author

✂️ [neuprintr](#) - author





✂️ [hemibrainr](#) - author

✂️ [mouselightr](#) - author














✂️ [insectbrainr](#) - author

- 30/09/2019 ● **Herchel Smith PhD Scholarship**  
Herchel Smith Foundation  Cambridge, UK
- 01/08/2018 ● **Boehringer Ingelheim PhD Scholarship**  
Boehringer Ingelheim Foundation  European

## EDUCATION

- 30/09/2020 ● **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** (best thesis), Winner of the **British Neuroscience Association Postgraduate Prize 2020** (best thesis)
- 01/07/2015 ● **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
- 01/09/2012 ● **A levels**  
Woodbridge High School  London, UK
  - 6 A\*s at A-level, comprising: Physics, Chemistry, Mathematics, English Literature, Philosophy and Russian, and in a history related EPQ (level 3) project
- 31/08/2010 ● **GCSEs**  
Woodbridge High School  London, UK
  - 13 A\*s: English Literature, English Language, Mathematics, Statistics, Core Science, Additional Science, History, Philosophy, Geography, French, Italian, Russian and Expressive Arts. **Jack Petchey Achievement Award**

## SKILLS

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



## LEADERSHIP

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



## PUBLICATIONS

	title	author	journal	year	cites	position	IF
1	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	2	1	7.616
3	The connectome of the adult Drosophila mushroom body provides insights into function	F Li, JW Lindsey, EC Marin, N Otto, M Dreher, G Dempsey, I Stark, ...	Elife	2020	36	6	7.616
4	BACTrace, a tool for retrograde tracing of neuronal circuits in Drosophila	S Cachero, M Gkantia, AS Bates, S Frechter, L Blackie, A McCarthy, ...	Nature methods	2020	5	3	26.919
5	A connectome and analysis						

This table shows all of my work, searchable on pubmed. Position is my place in the author list, capping at 6. IF is the journal's impact factor. Get in contact for information on recent projects.

Rx Most of my work has first been published on bioRxiv

@ Much of my work comes with open source R code

	of the adult <i>Drosophila</i> central brain	LK Scheffer, CS Xu, M Januszewski, Z Lu, S Takemura, KJ Hayworth, ...	Elife	2020	96	6	7.616
6	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, ...	Current Biology	2020	32	6	9.251
7	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, ...	Current Biology	2020	17	6	9.251
8	Complete connectomic reconstruction of olfactory projection neurons in the fly brain	AS Bates, P Schlegel, RJV Roberts, N Drummond, IFM Tamimi, ...	Current Biology	2020	46	1	9.251
9	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	56	1	7.616
11	Neurotransmitter classification from electron microscopy images at synaptic sites in <i>Drosophila</i>	N Eckstein, AS Bates, M Du, V Hartenstein, GSXE Jefferis, J Funke	bioRxiv	2020	6	2	0.000
12	Neural circuit basis of aversive odour processing in <i>Drosophila</i> from sensory input to descending output.	P Huoviala, MJ Dolan, F Love, P Myers, S Frechter, S Namiki, ...	bioRxiv	2020	24	6	0.000
13	Neuronal cell types in the fly: single-cell anatomy meets single-cell genomics	AS Bates, J Janssens, GS Jefferis, S Aerts	Current opinion in neurobiology	2019	28	1	6.541
14	Functional and anatomical specificity in a higher olfactory centre	S Frechter, AS Bates, S Tootoonian, MJ Dolan, J Manton, AR Jamasb, ...	Elife	2019	54	2	7.616
15	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	62	3	7.616
16	Neurogenetic dissection of the 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	3	3	7.616
18	Automated reconstruction of						

a serial-section EM  
Drosophila brain  
with flood-filling  
networks and local  
realignment

PH Li, LF Lindsey, M  
Januszewski, Z Zheng, AS  
Bates, I Taisz, M Tyka, ...

bioRxiv 2019 44 5 0.000

19

Communication from  
learned to innate olfactory  
processing centers is  
required for memory  
retrieval in Drosophila

MJ Dolan, G  
Belliard-Guérin,  
AS Bates, S  
Frechter, A  
Lampin-Saint-  
Amaux, ...

Neuron 2018 56 3 14.318



## 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
- 2017 ● **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

- 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

## 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, The Francis Crick Institute, serenedhawan@gmail.com



## 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  London, UK
- Student Placement with [Dr. Tammy Cheng](#), python programming

Made with the R package  
*pagedown* and  
*datadrivencv*.

Code available on   
*GitHub*.

Last updated on 2021-07-18.