

# Joanna C. Chang

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## Education

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**Imperial College London** | London, UK

*Oct 2020 - exp. Oct 2024*

PHD, COMPUTATIONAL NEUROSCIENCE

**Imperial College London** | London, UK

*Sep 2019 - Sep 2020*

MSC, BIOINFORMATICS AND THEORETICAL SYSTEMS BIOLOGY

**Distinction (81%), Top Student in Cohort**

**Pomona College** | Claremont, CA, US

*Aug 2015 - May 2019*

BA BIOLOGY, MINOR IN COMPUTER SCIENCE

**Summa Cum Laude (GPA: 3.99/4.0)**

## Professional & Research Experience

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**Imperial College London**

*Oct 2020 - present*

PHD CANDIDATE | SUPERVISOR: PROF. CLAUDIA CLOPATH, DR. JUAN GALLEGO

- Model motor cortical neural population activity during motor learning and adaptation using recurrent neural networks

**Synthace**

*Aug 2020 - Dec 2020*

DATA ANALYST

- Analyzed data to assess engagement and program needs for company's Computer-Aided Biology community sector

**Imperial College London**

*Jan 2020 - Sep 2020*

POSTGRADUATE RESEARCHER

**Thesis** | Supervisor: Dr. Tobias Reichenbach

- Developed mathematical and computational models to examine the frequency selectivity of the inner ear through a travelling wave on the basilar membrane

**Data Analysis Project** | Supervisor: Dr. Myrsini Kaforou

- Analyzed circular RNA expression in pediatric tuberculosis to identify potential diagnostic biomarkers

**Computing Project** | Supervisors: Dr. Alessia David, Prof. Michael Sternberg

- Visualized and integrated gene pathway, protein-protein interaction, and gene expression data within networks to aid disease detection for protein variants

**Harvey Mudd College**

*Apr 2017 - Nov 2019*

COMPUTATIONAL BIOLOGY RESEARCH ASSISTANT | SUPERVISOR: DR. MATINA DONALDSON-MATASCI

- Examined ant nest network formation under spatial constraints with laboratory experiments and agent-based modelling

**Middle Tree**

*Jan 2019 - May 2019*

SOFTWARE DEVELOPMENT INTERN

- Developed back-end to facilitate customer registration and record data into customer management systems

**Pomona College**

*Sep 2016 - May 2017*

ECOLOGY RESEARCH ASSISTANT | SUPERVISORS: PROF. WALLACE MEYER

- Examined carbon and nitrogen storage in native and non-native Californian habitats

**Tufts University**

*May 2016 - Aug 2016*

ECOLOGY RESEARCH ASSISTANT | SUPERVISORS: DR. PHIL STARKS, DR. RACHAEL BONOAN

- Examined the effects of essential amino acids on social immunity and foraging behavior in honeybees
- Utilized thermal imaging programs to track colony-level fever

## Publications

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\* equal contribution; † equal supervision

Fortunato C, Bennasar-Vázquez J, Park J, **Chang JC**, Miller LE, Dudman JT, Perich MG, Gallego JA. 2023. Nonlinear manifolds underlie neural population activity during behaviour. *bioRxiv*.

**Chang JC**, Perich MG, Miller LE, Gallego JA<sup>†</sup>, Clopath C<sup>†</sup>. 2023. De novo motor learning creates structure in neural activity space that shapes adaptation. *bioRxiv*.

Safaie M\*, **Chang JC\***, Park J, Miller LE, Dudman J, Perich MG<sup>†</sup>, Gallego JA<sup>†</sup>. 2022. Preserved neural population dynamics across animals performing similar behaviour. *bioRxiv*.

**Chang J**, Powell S, Robinson E, Donaldson-Matasci M. 2021. Nest choice in arboreal ants is an emergent consequence of network creation under spatial constraints. *Swarm Intelligence*

Bonoan RE, Iglesias Feliciano PM, **Chang J**, Starks PT. 2020. Social benefits require a community: the influence of colony size on behavioral immunity in honey bees. *Apidologie*.

## Presentations

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### TALKS

2023	Bernstein Conference	Berlin, Germany
	Neural Control of Movement Conference	Victoria, Canada
	COSYNE Conference	Montreal, Canada
2020	Synthace Computer-Aided Biology Community, <i>Invited by Dr. Fane Mensah</i>	London, UK
2018	University of Lausanne, <i>Invited by Prof. Laurent Keller</i>	Lausanne, Switzerland

### POSTERS

2023	Bernstein Conference	Berlin, Germany
	COSYNE Conference	Montreal, Canada
2022	Society for Neuroscience (SfN) Conference	San Diego, US
	Neural Control of Movement Conference	Dublin, Ireland
	COSYNE Conference	Lisbon, Portugal
2018	SACNAS Conference for Diversity in STEM, <i>Travel grant</i>	San Antonio, TX, US
	International Union for the Study of Social Insects Conference	São Paulo, Brazil

## Awards & Fellowships

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2023	Neural Control of Movement (NCM) Scholarship	
2020	Eurofins Foundation Postgraduate Prize, <i>for top student in MSc course</i>	£ 500
	<b>Wellcome Trust 4-Year PhD Studentship</b>	
2019	University of Edinburgh Biological Sciences Postgraduate Bursary, <i>declined offer</i>	€ 10,000
	Bessie Reiner Dill Award	\$ 10,000
	Sherwood Heiser Fellowship	\$ 5,000
	Phi Beta Kappa Honor Society Award	\$ 2,000
2018	<b>Harvey Mudd Summer Research Fellowship</b>	
	Rose Hills Foundation Scholarship	\$ 17,000
2017	<b>Howard Hughes Medical Institute Undergraduate Research Fellowship</b>	
	Edison STEM Scholarship	\$ 3,000
	Robinson Scholarship	\$ 20,000
2016	<b>NSF Research Experience for Undergraduates Fellowship</b>	
	Brown Scholarship	\$ 16,000
	Steele Foundation Scholarship	\$ 11,000
2014	<b>California Institute of Technology Summer Research Connection Fellowship</b>	

## Teaching Experience

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2023	<b>Computational Neuroscience</b>	<i>Imperial College London</i>
2022	<b>Computational Neuroscience</b>	<i>Imperial College London</i>
2021	<b>Programming II</b>	<i>Imperial College London</i>
2020	<b>Probability and Statistics</b>	<i>Imperial College London</i>
2019	<b>Biochemistry with Lab</b>	<i>Pomona College</i>
2018	<b>Biochemistry with Lab</b>	<i>Pomona College</i>
2017	<b>Genetics</b>	<i>Pomona College</i>
	<b>General Chemistry II</b>	<i>Pomona College</i>
2016	<b>General Chemistry I</b>	<i>Pomona College</i>

## Service & Outreach

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**Imperial College London Outreach** *Nov 2019 - present*

STEM AMBASSADOR

- Lead design and prototyping workshops in the university's Makerspace
- Demonstrate software and equipment use for technologies including 3D printing, laser cutting, and CAD

**Tech for Good** *Jan 2019 - May 2019*

COORDINATOR

- Recruited and oversaw teams on 3 coding projects that emphasized using technology for social good
- Cleaned and analyzed survey data through a partnership with ActiveSGV, a public health non-profit

**Quantitative Skills Center** *Jan 2017 - Dec 2018*

FELLOW

- Provided individual mentoring partnerships for biology, chemistry, and computer science courses

### MENTORING

- 2022-23 Alvaro Fernandez-Moris, MEng, Imperial College London
- 2021-22 Ciara Gibbs, MEng, Imperial College London
- 2021 Mireia Munoz Rojo, BSc, Imperial College London

### PEER REVIEW

Reviewed for: Current Biology | Nature Neuroscience | Proceedings of the National Academy of Sciences (PNAS)