Jeremi Chabros

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Education

MB BChir, University of Cambridge School of Clinical Medicine 2021 – 2024 (expc.)

BA (Hons), University of Cambridge 2018 – 2021

Physiology, Development and Neuroscience

Thesis: *The Emergence of Network Dynamics in Developing Cortical Circuits*

Supervisor: Dr Susanna Mierau (Brigham and Women's Hospital, Harvard Medical School)

Research experience

Student researcher Apr 2022 – Present

Brain Physics Lab, Division of Neurosurgery, Department of Clinical Neurosciences, University of Cambridge

Improving diagnostics of cerebrospinal fluid (CSF) disorders. Developed a novel method of analysing CSF dynamics using Bayesian optimisation. Eliminated unphysiological parameter predictions and significantly reduced the model fitting error compared to the current state-of-the-art gradient descent method.

Computational Supervisor: Dr Peter Smielewski (Principal Investigator)

Clinical Supervisor: Dr Alexis Joannides (Honorary Consultant Neurosurgeon)

Chabros et al. 2022. *Optimisation of a mathematical model of cerebrospinal fluid dynamics using infusion studies*. [Oral]. International Symposium on ICP and Brain Monitoring, 14 - 18 Nov, Cape Town, South Africa

Chabros et al. 2023. *Improving assessment of CSF dynamics in infusion studies using a Bayesian approach*. [Submitted to the Society of British Neurological Surgeons Spring Meeting 2023 in Cork, Ireland]

Student researcher Apr 2020 – Present

Department of Physiology, Development and Neuroscience, University of Cambridge

Synapse & Network Development Group. Studying cellular-scale neural network dynamics in 2D cortical cultures and 3D human cerebral and spinal cord organoids. Refining existing and developing new computational tools for the analysis of microelectrode array (MEA) recordings.

Supervisor: Dr Susanna Mierau (Brigham and Women's Hospital, Harvard Medical School)

Mierau et al. 2022. *Computational tool for comparing development of cellular-scale network activity from microelectrode array (MEA) recordings of 2D neuronal cultures and 3D human cerebral organoids*. [Poster]. FENS Forum 2022, 9-13 July, Paris, France

Projects

Mierau et al. 2023. *A Cellular-Scale Network Approach to Understanding Cognitive Dysfunction in Rett Syndrome and Autism Spectrum Disorder (ASD)*. [Abstract submitted to International Society for Autism Research Annual Meeting 2023]

Chabros et al. 2023. *Cycling-related craniospinal injuries admitted to a Major Trauma Centre in the cycling capital of the UK*. [Abstract submitted to the Society of British Neurological Surgeons Spring Meeting 2023 in Cork, Ireland]

Chabros et al. *Novel neuronal spike detection method based on continuous wavelet transform with data-driven automatic template selection*

Chabros et al. *High-performance MEX implementation of the Spike Time Tiling Coefficient*

Skills

Experimental & data analysis skills

Time-Series Analysis ○ Mathematical Modeling ○ Fluid Dynamics ○ Bayesian Optimization ○ Nonlinear Dynamics ○ Nonlinear Optimization ○ Parallel Computing ○ Electrophysiology (MEA) ○ Control Engineering ○ Graph Theory ○ Neural Networks ○ Time-frequency Analysis

Programming languages

MATLAB (MEX, UI Applications, Parallel Computing)	Proficient
Python	Intermediate
Julia	Intermediate

Accomplishments

UK National Neuroanatomy Competition – Winner (clinical category and overall)
European Union Contest for Young Scientists – 2nd award
E(x)plory Science Contest – Special Award (MILSET Expo-Sciences Europe)
Neuronus IBRO&IRUN Neuroscience Forum – Most Active Participant Award (while a high school student)
Path to Harvard – Laureate (7th edition)
Brain Bee Neuroscience Competition – Winner (Poland)
Minister of Education Scholarship (a merit-based award for the most outstanding students in the country)
Prime Minister of Poland Scholarship (a merit-based award for the most outstanding students in the country)

Extracurricular activities

Associate Clinical Supervisor, University of Cambridge School of Clinical Medicine Sep 2022 – Present
Teaching physical examinations and basics of medicine to undergraduate and junior clinical students.

Collegium Invisibile, Warsaw, Poland May 2022 – Present
Collegium Invisibile is a prestigious academic society enabling outstanding Polish students to undertake individual studies under guidance of distinguished scholars. Admitted among ten best students in Poland.

Editor, British Neuroscience Association (BNA) Apr 2020 – Present
Editor at the 'Bright Brains', a newsletter published by students and early career members of the BNA.

Leadership roles

Cambridge Oral & Maxillofacial Surgery Society	President (22-23)
Cambridge Robotic Surgery Society	Vice-President (22-23)
Cambridge Neurological Society	Publicity Officer (21-22)
Department of Physiology, Development and Neuroscience	Student Representative (20-21)

Goalkeeper, Cambridge University Handball Club & Premier Handball League Oct 2018 – Present
Cambridge Half-blue award for sports excellence. Paul Day Sports Scholarship.

Mentor, Project Access May 2018 – Present
Project Access is a non-profit organization dedicated to helping underprivileged applicants by offering mentorship from current university students. I mentor neuroscience, medicine and medical sciences applicants.

Interests

Fly fishing ○ Typography ○ Paleontology