

Peter Zhukovsky

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EDUCATION

- 2015-2019 **PhD in Psychology, Department of Psychology, Cambridge University, Downing College, UK**
Thesis: Functional organisation of behavioural inhibitory control mechanisms in cortico-basal ganglia circuitry: implications for stimulant use disorder - supervised by Prof Jeffrey W Dalley; 4 published articles, 1 under review
- 2012-2015 **BA, Cambridge University, Churchill College, UK** - Experimental Psychology, Natural Sciences Tripos, First Class, (73%, finished top 3 of the class); published 3 articles
- 2011-2012 **SAT tests** (Math 800 out of 800, French 800/800, Reasoning 2240/2400)
- 2006-2011 **Albertus-Magnus Gymnasium, Stuttgart, Germany**
Abitur (final year exams) with 1,1 - (1,0 is best and 6,0 poorest grade)
Core Subjects: Chemistry (15/15); Mathematics (15/15); Economics (14/15)

EMPLOYMENT

- 2020-present **Postdoctoral Fellow, Centre for Addiction and Mental Health, Kimel Family Imaging-Genetics laboratory, Canada**
Topic: Neural and cognitive mechanisms underlying major depression, supervised by Prof Aristotle N Voineskos
- 2019 **Postdoctoral Researcher, Cambridge University, Department of Psychiatry, UK**
Topic: Morphometric similarity and accelerated ageing in stimulant use disorder, supervised by Dr Karen Ersche, article in submission
- 2015-2019 **Tutor, Supervisor for Experimental Psychology (penultimate and final years), Cambridge University, Downing College, UK**
- 2014 **Summer internship, Junior Researcher Programme, University of Cambridge**
Topic: Researched decision-making underlying medical travel; published two articles with Dr Ruggeri (see below), supervised by: Dr Kai Ruggeri.
- 2011-2012 **German Civil Service placements;** teaching final year high school students at Studienkreis Weinstadt and Nachhilfe Effektiv

GRANTS AND AWARDS

- 2021-present Reviewer in the Postdoctoral Fellow Review Program for the Doctoral Research Award, Canadian Institute of Health Research
- 2020-present Canadian Institute of Health Research Postdoctoral Fellowship (4 years, 180,000), ranked 1.58% among 506 applicants
- 2020 Labatt Family Fellowship in Depression Biology (1 year, 60,000 CAD)
- 2019 Postdoctoral salary, Cambridgeshire and Peterborough NHS Foundation Trust (3 months)
- 2015-2019 Pinsent Darwin Scholarship from the Department of Physiology, Development and Neuroscience, University of Cambridge (65,000 GBP)

PUBLICATIONS

Zhukovsky, P.*, Ruggeri, K.*, Garcia-Garzon, E., Plakolm, S., Haller, E., Petrova D., Mahalingam, V., and Menezes, I.G. 2016. “Global Health Policy and Access to Care: Investigating Patient Choice on an International Level Using Social Media.” *Frontiers in Public Health* 3 *authors equally contributed

Garcia-Garzon, E., **Zhukovsky, P.**, Haller, E., Plakolm, S., Fink, D., Petrova, D., Mahalingam, V., Menezes, I. G. and Ruggeri, K. 2016. “Multilevel Modeling and Policy Development: Guidelines and Applications to Medical Travel.” *Frontiers in Psychology* 7

Pérez Riveros, O., Aitken, M.R.F, **Zhukovsky, P.**, Soto, F.A., Urcelay, G.P., Dickinson, A. 2016. “Human instrumental performance in ratio and interval contingencies: a challenge for associative theory.” *The Quarterly Journal of Experimental Psychology*

Zhukovsky, P., Alsö, B.J., Jupp, B. Xia, J., Guiliano, C., Jenner, L., Griffiths, J., Riley, E., Ali, S., Roberts, A.C., Robbins, T.W. and Dalley, J.W. 2017. “Perseveration in a spatial-discrimination serial reversal learning task is differentially affected by MAO-A and MAO-B inhibition and associated with reduced anxiety and peripheral serotonin levels.” *Psychopharmacology*

Zhukovsky, P., Puaud, M., Jupp, M., Alsö, B.J., Jiang, W., Mehrke, L., Xia, J., Searle, L., Morris, Z., Sabir, A., Giuliano, C., D’Aquisto, F., Belin, D., Dalley, J.W. 2019. “Withdrawal from escalated cocaine self-administration impairs reversal learning by disrupting the effects of negative feedback on reward exploitation: a behavioral and computational analysis.” *Neuropsychopharmacology*

Zhukovsky, P.*, Morein-Zamir, S.*, Meng, C., Dalley, J.W., Ersche, K.D. 2020 “Network failures: when incentives trigger impulsive responses.”, *Human Brain Mapping* *authors equally contributed

Zhukovsky, P*, Morein-Zamir, S*, Ziauddeen H., Fernandez-Egea, E., Meng, C., Regenthal, R., Sahakian, B.J., Bullmore, E.T., Robbins T.W., Dalley J.W., Ersche, K.D., “Prefrontal cortex activation and stopping performance underlie the beneficial effects of atomoxetine on response inhibition in healthy and cocaine use disorder volunteers”, *Biological Psychiatry: CNNI*. *authors equally contributed

Coughlan, G., **Zhukovsky, P.**, Puthusseryppady V., Gillings, R., Minihane, A., Cameron, D., Hornberger, M., 2020, “Functional connectivity between the entorhinal and posterior cingulate cortices underpins navigation discrepancies in at-risk Alzheimer's disease.”, *Neurobiology of Ageing*

Sala-Bayo, J., Fiddian, L., Nilsson, S., Hervig, M., McKenzie, C., Mareschi, A., Boulos, M., **Zhukovsky, P.**, Nicholson, J., Dalley J.W., Alsio, J., Robbins, T.W., (2020) “Dorsal and ventral striatal dopamine D1 and D2 receptors differentially modulate distinct phases of serial visual reversal learning”, *Neuropsychopharmacology*.

Zhukovsky, P.*, Savulich, G.*, Morgan, S.E., Dalley, J.W., Williams, G., Ersche, K.D., Abnormal brain ageing in stimulant use disorder: a morphometric similarity network analysis (*Brain Communications*, under review) *authors equally contributed

Zhukovsky, P., Anderson, J.A.E., Coughlan, G., Mulsant, B.H. Cipriani, A., Voineskos, A.N., “Coordinate-based network mapping of brain structure in major depressive disorder in younger and older adults: a systematic review and meta-analysis”, *American Journal of Psychiatry*

Coughlan, G.*, **Zhukovsky, P.***, Voineskos, A.N. Grady, C., 2021 “A profile of brain reserve in adults at genetic risk of Alzheimer's disease”, *Alzheimer’s and Dementia: Diagnosis, Assessment and Disease Monitoring* *authors equally contributed

Wainberg, M., **Zhukovsky, P.**, Hill, S., Felsky, D., Voineskos, A.N., Kennedy, S., Hawco, C., Tripathy, S., 2021, “Symptom dimensions of major depression in a large community-based cohort”, *Psychological Medicine*

Zhukovsky, P., Wainberg M., Milic, M., Tripathy, S.J., Mulsant, B.H., Felsky, D.*, Voineskos, A.N.* Multi-scale neural signatures of major depressive, anxiety, and stress-related disorders *PNAS* (In submission)

Zhukovsky, P., Felsky, D., French, L., Mulsant, B.H., Diniz, B., Voineskos, A.N. Network connectivity and transcriptomic signatures underlying brain ageing in active and remitted late-life depression (In submission)

Zhukovsky, P., Coughlan, G., Dickie, E.W., Hawco, C., Voineskos, A.N., Alternative labeling tool: a minimal algorithm for denoising single-subject resting-state fMRI data with ICA-MELODIC (In submission, *Frontiers in human neuroscience*)

Moffat, G.*, **Zhukovsky, P.***, Coughlan, G., Voineskos, A.N. Unravelling the relationship between amyloid accumulation and brain network function in normal aging and preclinical Alzheimer's Disease: a longitudinal analysis in submission (In submission, *Brain Communications*) *equally contributed

Zhukovsky P.*, Coughlan, G.*, Grady, C., Voineskos, A.N., Large-scale network organization that underlies resilience in preclinical Alzheimer's disease (In submission, *nature aging*) *equally contributed

PRESENTATIONS & TALKS

Zhukovsky, P., Plackolm, S., Ruggeri, K. *Factors that influence decision-making process of potential medical travellers*, **Junior Researcher Programme Conference**, Cambridge, 11-17 Aug 2014, p. 20

Zhukovsky, P., Alsiö, J., Jupp, B., Xia, J., Giuliano, C., Roberts, A.C., Robbins, T.W., Dalley, J.W., *Perseveration in a spatial-discrimination serial reversal learning task is differentially affected by MAO-A and MAO- inhibition and associated with reduced anxiety and peripheral serotonin levels*, **British Neuroscience Association: Festival of Neuroscience 2017**, 10-13 April 2017 Poster presentation and rapid-fire talk

Zhukovsky, P., *Neural mechanisms of behavioural inflexibility in psychostimulant addiction*, **Mental Health and Human Resilience 2017**, London, 21 June 2017, Talk

Zhukovsky, P., Meng, C., Dalley, J.W., Ersche, K.D. *Neural correlates of waiting impulsivity in stimulant drug addiction*, **EBPS Computational Approaches on Animal & Human Behavior**, Cambridge, July 2018

Zhukovsky, P., Morein-Zamir, S., Meng, C., Regenthal, R., Sahakian, B.J., Robbins, T.W., Dalley, J.W., Ersche, K.D., *Atomoxetine alters stopping networks in healthy controls and participants with cocaine use disorder without affecting stopping performance* European College of Neuropsychopharmacology Congress, Copenhagen, Denmark, 2019

Zhukovsky, P.* Anderson, J.A.E*, Voineskos, A.N. *Lesion Network Mapping in LLD: a Functional and Morphometric Approach*, **Harvey Stancer Research Day**, University of Toronto, Toronto, June 2020

Zhukovsky, P., Wainberg M., Milic, M., Felsky, D.*, Voineskos, A.N.* *Functional and structural neural correlates shared across depression and anxiety*, **Society of Biological Psychiatry Annual Meeting (Virtual)**, May 2021

Zhukovsky, P., Wainberg M., Milic, M., Felsky, D.*, Voineskos, A.N.* *Functional and structural neural correlates of executive function in the UK biobank*, **Department of Psychiatry Research Day**, University of Toronto, Toronto, June 2021

TRANSFERABLE SKILLS

Organisation Oct 2013–Oct 2014 Elected **Student Representative** for Psychology Department

Oct 2013–Oct 2014 Elected **Student Representative** for Philosophy Faculty
As a student rep, worked together with the teaching coordinators - organised additional teaching and successfully campaigned for changes in course structure.

Oct 2014–June 2015 **Director for Publicity** at the Cambridge University Scientific Society. Doubled the society's income from memberships and donations compared to last year's income just within October 2014. Organizing and promoting weekly talks (100 people attending each talk) and other events that bring students in contact with contemporary scientific developments.

Oct 2015–Oct 2016 **Conference Organiser** with the Cambridge Neurological Society, Organised and hosted the annual conference featuring prominent speakers, various workshops and advertised the event with biosciences students

August 2017–2019 **Graduate Student Representative** for the Department of Psychology, Working together with the teaching staff and graduate students to improve graduate learning experience; organising social and educational events

- Teaching* 2015–2016 Supervised four students for their final year undergraduate projects (3 of whom received class I and one class 2.i marks). Weekly supervision of two undergraduates on 2nd year cognitive neuroscience modules (one of whom received a distinction).
- 2016–2017 Supervised eight students for their final year undergraduate projects. Provided weekly undergraduate supervisions (2nd and 3rd year NST Psychology) for 10 students, balancing the teaching responsibilities with research progression
- November 2017 Neuroanatomy demonstrations for Year I and Year II undergraduates
- 2017–2018 Weekly supervision of four students, two of whom have special needs
- 2020 – Supervising a summer student in the Kimmel Family Laboratory
- 2021 – Supervising two summer students, one of whom produced a manuscript
- Leadership/
Team work* Sep 2010–May 2011: led a team of 4 other students in “**Jugend Gründet**” (Youth Establishes), a federal contest in all German-speaking countries, to be in the **best 5%** in Stage I (created a business plan for an enterprise selling LEDs), **best 30%** in Stage II
- Feb 2012–Sep 2012: worked at **Studienkreis Weinstadt** and **Effektiv Nachhilfe** Rems-Murr Kreis - taught Mathematics, Physics and English for grade 8-13 (students in their final Abitur years).
- Teaching and participating in university governance bodies, collaborating with researchers from other disciplines in completing PhD projects
- International Postdoc community representation at Centre for Addiction and Mental Health with the Institute of Medical Science, University of Toronto

RESEARCH SKILLS

Peer Review | For *American Journal of Psychiatry*, *Frontiers in Neuroscience*, *Brain Neuroscience Advances*, and *Psychopharmacology*

Neuroimaging | Development of image analysis pipelines for rodent MRI data. Specifically, resting state fMRI image analysis using FSL (ICA-Melodic), AFNI (meica.py). Diffusion tensor image pre-processing using FSL and tract based structural statistics analysis (FSL TBSS). Probabilistic tractography using FSL bedpostx and probtrackx for probabilistic tractography (ongoing). Human task-based fMRI analysis of the monetary incentive delay and stop-signal task using FSL FEAT and SPM dynamic causal models. Graph theory application using the Brain Connectivity Toolbox (Rubinov, Sporns et al) to explore structural connectivity features such as small-worldness. Dynamic causal modelling and SVM classification (MATLAB, R).

Basic python programming for controlling an LED and synchronising it with a Bruker 9.4T scanner in an fMRI validation study: https://github.com/peterzhukovsky/pi_led_control

Imaging-Genetics | Transcriptomics in the Allen Human Brain Atlas, pre-processing microarray gene expression data and linking MRI brain maps to gene expression brain maps using multivariate partial least squares.

Data analysis | Multilevel and mixed effect linear modelling in R and stata (decision making in medical travel), factor analysis and bootstrapping, factorial ANOVA design for rodent behavioural data.

Task design and computational modelling | Writing MATLAB toolboxes for modelling reinforced learning behaviour using Q-learning and the softmax decision rule: https://github.com/peterzhukovsky/reversal_learning

Writing MATLAB toolboxes to fit Bayesian models to reinforced learning task data (including variable memory size and flexible priors): https://github.com/peterzhukovsky/bayesian_learner

Models parameter fitting is achieved using maximum likelihood estimation in discrete model space (with analytic implementations of some models available); model comparison is achieved using Bayesian Information Criterion and pseudo-r² goodness of fit measures.

Molecular Biology | Blood and brain tissue genotyping using quantitative real time PCR assays, monoamine concentration quantification using HPL-ECD, Nissl cell staining, flow cytometry training

Experimental Design | Longitudinal drug trials and identifying biomarkers for substance abuse, reinforcement schedule task design for undergraduate project

Other Training | Whisker server configuration for rodent testing, behavioural and systemic pharmacology, rodent anaesthesia and cocaine self-administration, bioinformatics statistics courses, SPM course (UCL, October 2017), FSL course (Oxford, April 2018)

ADDITIONAL SKILLS

Computing FSL, SPM, AFNI, R, MATLAB, STATA, SPSS, Prism, CorelDraw, Microsoft Office Suite (Word, Excel, PowerPoint Publisher); Website design – created my own website: www.zhukovsky.de and <http://neuroconference.co.uk/> for a conference

Languages German (native), Russian (native), English (fluent – IELTSs 8.0/9.0), French (fluent – 800/800 in SAT French with Listening)

Music Played clarinet in Weinstadt Orchestra until 2012

Sports Cambridge University Taekwondo Club, Athletics Club Weinstadt, Cycling Football (Churchill College M3 Team), Skiing

Travel France, Germany, Spain, Italy, Netherlands, Austria, Switzerland, Croatia

Driving Full clean German driving license

REFERENCES

Per request