

# Kamila Maria Jozwik

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## Education

- **Massachusetts Institute of Technology and University of Cambridge**  
*Sir Henry Wellcome postdoctoral fellow* 2018 -
- **Free University Berlin**  
*Humboldt postdoctoral fellow* 2017
- **University of Cambridge**  
*PhD in Biological Sciences* 2011 - 2016
- **University of Cambridge**  
*MPhil in Biological Sciences* 2010 - 2011
- **University of Warsaw**  
*BSc in Biotechnology (Thesis project at Oxford University)* 2007 - 2010

## Research Experience

- **Topography and scaling in deep neural networks**  
We build in topography and number of neuron constraints in deep neural networks to make them more brain-like.  
(Supervised by James DiCarlo and Nancy Kanwisher, MIT)
- **Animacy dimensions in object recognition**  
We compared the contribution of different animacy dimensions in explaining representations of object images in humans and deep neural networks.  
(Supervised by Nikolaus Kriegeskorte and Radoslaw Martin Cichy, Columbia University and Free University Berlin)
- **Object and word representations in humans and deep neural networks**  
We compared the representations of object images and written words in humans and deep neural networks.  
(Supervised by Radoslaw Martin Cichy, Free University Berlin)
- **Object representations in human and monkey inferior temporal cortex, human behaviour and deep neural networks**  
We compared the importance of visual features and semantic categories in primate inferior temporal cortex, human behaviour as well as deep neural networks.  
(Supervised by Marieke Mur and Nikolaus Kriegeskorte, MRC Cognition and Brain Sciences Unit, University of Cambridge)

- **Face similarity and identity judgments**

We defined a function that provides an approximation to the human face similarity judgments using Basel Face Space model, investigated individual differences in face perception and explored face similarity representations in DeepFace neural network.

(Supervised by Nikolaus Kriegeskorte, MRC Cognition and Brain Sciences Unit, University of Cambridge)

- **The role of sex hormones in the development of autism**

We characterised neurons developed from Induced Pluripotent Stem Cells (IPSCs) derived from autistic subjects upon testosterone administration through RNA and exome sequencing.

(Supervised by Simon Baron-Cohen, Autism Research Center, University of Cambridge and Jason Carroll, Cancer Research UK Cambridge Institute, University of Cambridge)

- **Functional dissection of hormonal gene transcription programs in breast cancer**

We characterised roles of transcription factors (FOXA1, MLL3 and GRHL2) and the mechanism underlying deposition of enhancer histone modification during breast cancer progression.

(Supervised by Jason Carroll, Cancer Research UK Cambridge Institute, University of Cambridge)

## Skills

- Programming in MATLAB and Python
- Computational Modelling
- Psychophysics
- fMRI, MEG, EEG
- Representational Similarity Analysis (RSA)
- Decoding Analysis
- Multi-Voxel Pattern Analysis (MVPA)
- Genomics, Proteomics and Molecular Cellular Biology
- Bioinformatic Analysis of ChIP-sequencing and RNA-sequencing

## Awards

Sir Henry Wellcome Postdoctoral Fellowship . . . . .	2018
Humboldt Foundation Postdoctoral Fellowship . . . . .	2017
International Brain Research Organization Stipend . . . . .	2016
OHBM Merit Abstract Award . . . . .	2016
Free University Dean's stipend . . . . .	2016
Concepts, Actions and Objects conference Abstract Award . . . . .	2016
Elsevier/Vision Research Travel Grant . . . . .	2016
Grindley Travel Grant from Experimental Psychology Society . . . . .	2015
Guarantors of Brain Travel Grant . . . . .	2015
Cambridge Philosophical Society Conference Grant . . . . .	2015
Cambridge University Representative for Global Young Scientists Summit, Singapore	2013
Amgen Scholars Travel Award . . . . .	2013
Darwin College Conference Grant . . . . .	2013

Cambridge Research Institute PhD studentship . . . . .	2011
Corbridge Cambridge Trust Scholarship for MPhil Studies . . . . .	2010
Path to Harvard Competition Winner, Academic Visit to Harvard University and MIT	2010
University of Oxford Scholarship for Research Project . . . . .	2010
Molecular Biosciences International Student Program Scholarship at Aarhus University	2009
Amgen Research Scholarship at University of Cambridge . . . . .	2009

## Selected conference talks and poster presentations

- **Jozwik, K.M.**, Kanwisher, N. & DiCarlo, J.J. *"Explaining brain area scaling and topography in monkey and human IT with deep neural networks"* Talk at Center for Brains, Minds and Machines retreat, 2018
- **Jozwik, K.M.**, Kriegeskorte, N., Cichy, R. M., Mur, M. *"Deep convolutional neural networks, features, and categories perform similarly at explaining primate high-level visual representations"* Poster at Cognitive Computational Neuroscience conference, 2018
- **Jozwik, K.M.**, Charest I., Kriegeskorte, N. & Cichy, R. M. *"Animacy dimensions ratings and approach for decorrelating stimuli dimensions"* Poster at Cognitive Computational Neuroscience conference, 2017
- **Jozwik, K.M.**, Cichy, R. M. *"Modeling visual brain responses by image and word similarity judgments: combining fMRI, MEG and deep neural networks"* Poster at European Conference on Visual Perception, 2017
- **Jozwik, K.M.**, Kriegeskorte, N., Cichy, R. M., Mur, M. *"Representation of visual features and categories in across space and time in human, monkey, and convolutional neural networks"* Talk at nanosymposium at the Society for Neuroscience conference, 2016
- **Jozwik, K.M.**, Kriegeskorte, N., Mur, M. *"Visual features as stepping stones toward semantics: Explaining object similarity in IT and perception with non-negative least squares"* Talk at nanosymposium at the Society for Neuroscience conference, 2015
- O'Keefe\*, **Jozwik, K.M.\***, Kriegeskorte, N. *"Predicting face dissimilarity judgements from Basel Face Space"* Poster at Vision Sciences Society conference, 2015 (\*these authors contributed equally to this work)
- **Jozwik, K.M.**, Chernukhin, I., Serandour, A. A., Carroll, J.S. *"Interplay between FOXA1, MLL3 and H3K4methylation at enhancers in breast cancer"* Poster at Cold Spring Harbor conference on Epigenetics, Chromatin and Transcription, 2014

## Publications

- **Jozwik, K.M.**, Kriegeskorte, N., Cichy, R. M., Mur, M. (2018)  
*"Deep convolutional neural networks, features, and categories perform similarly at explaining primate high-level visual representations"* Conference on Cognitive Computational Neuroscience.

- **Jozwik, K.M.**, Kriegeskorte, N., Storrs, K. R., Mur, M. (2017)  
*"Deep Convolutional Neural Networks Outperform Feature-Based But Not Categorical Models in Explaining Object Similarity Judgments"* *Frontiers in Psychology*, 8(10):1726.
- **Jozwik, K.M.**, Charest I., Kriegeskorte, N. Cichy, R. M. (2017)  
*"Animacy dimensions ratings and approach for decorrelating stimuli dimensions"* Conference on Cognitive Computational Neuroscience.
- **Jozwik, K.M.**, Kriegeskorte, N., Mur, M. (2016)  
*"Visual features as stepping stones toward semantics: Explaining object similarity in IT and perception with non-negative least squares"* Special issue "Functional selectivity in perceptual and cognitive systems" *Neuropsychologia* 83:201-26.
- **Jozwik, K.M.**, Chernukhin, I., Serandour, A. A., Nagarajan, S., Carroll, J.S. (2016)  
*"FOXA1 directs H3K4 monomethylation at enhancers via recruitment of the methyltransferase MLL3"* *Cell Reports* 17(10):2715-2723.
- **Jozwik, K.M.**, Carroll, J.S. (2012)  
*"Pioneer factors in hormone dependent cancers"* *Nature Reviews Cancer* 12(6):381-5.

Published abstracts:

- Cichy, R., Kriegeskorte, N., van den Bosch, J., (2017) **Jozwik, K.M.**, Charest, I. *"Characterizing the spatio-temporal dynamics of behavior-related neural activity during human visual object perception"* *Journal of Vision* 17 (10), 1341-1341
- **Jozwik, K.M.**, Kriegeskorte N., Cichy R., Mur M. (2016) *"Visual features versus categories: Explaining object representations in primate IT and deep neural networks with weighted representational modeling"* *Journal of Vision* 15(12):421-421.
- Storrs K.R., **Jozwik, K.M.**, O'Keefe\*, J., Kriegeskorte, N. (2016) *"Predicting how similar two faces look, using deep neural networks and optimised stimuli"* *PERCEPTION* 45, 203-204
- O'Keefe\*, J., **Jozwik, K.M.\***, Engel S., Kriegeskorte N. (2015) *"Predicting face similarity judgements from Basel Face Space"* *Journal of Vision* 16(12):511-511. (\*these authors contributed equally to this work)

Preprints:

- Adhya, D., Swarup, V., Nowosaid, P., Shum, C., (2018) **Jozwik, K.**, McAlonan, G., Mendez, M.A., Horder, J., Murphy, D., Geschwind, D.H, Price, J., Carroll, J., Srivastava, D.P., Baron-Cohen, S. *"Shared gene co-expression networks in autism from induced pluripotent stem cell (iPSC) neurons"* BiorXiv
- Cichy, R. M., Kriegeskorte, N., **Jozwik, K.M.**, van den Bosch, J.J.F. , Charest, I. (2017) *"Neural dynamics of real-world object vision that guide behaviour"* BiorXiv

Manuscripts in preparation:

- **Jozwik, K.M.**, Kriegeskorte, N., Cichy, R. M., Mur, M. *"Visual features versus categories: Explaining object representations in primate IT and deep neural networks"*
- **Jozwik, K.M.**, Cichy R.M. *"Representations of images and words similarity judgments in space, across time and in deep neural networks."*

## Research funding

- "Explaining the heterogeneity and topography in inferior temporal cortex with deep neural networks", Sir Henry Wellcome Postdoctoral Fellowship, University of Cambridge, Massachusetts Institute of Technology, Wellcome Trust, UK, US, 2018
- "The spatio-temporal representation of objects in visual and semantic domains in human brain and machine", Humboldt Foundation Postdoctoral Fellowship, Free University Berlin, Humboldt Foundation, Germany, 2017
- "Mechanisms of a pioneer factor FOXA1 function in breast cancer", Cambridge Research Institute PhD Studentship, University of Cambridge, United Kingdom, Cancer Research UK, 2011-2015
- "The mechanisms of DNA repair", Corbridge Cambridge Trust Scholarship for MPhil Studies, University of Cambridge, United Kingdom, Corbridge Trust, 2010-2011
- "Roles of Raly protein in DNA repair", MRC Weatherall Institute of Molecular Medicine Studentship, Oxford University, United Kingdom, Weatherall Institute of Molecular Medicine, 2010
- "Roles of ATRIP protein in DNA repair", Amgen Foundation Research Scholarship, University of Cambridge, United Kingdom, Amgen Foundation, 2009
- "Mechanisms of transcription", Molecular Biosciences International Student Scholarship, Aarhus University, Denmark, Danish National Research Foundation, 2009

## Academic service

- Reviewer at Nature Human Behaviour, Nature Communications, Neuroimage, Journal of Experimental Psychology: Human Perception and Performance, IEEE Journal of Biomedical and Health Informatics, Molecular Autism

## Referees

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|--|---|--|
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| 4. Prof Nancy Kanwisher<br>ngk@mit.edu<br>+1 617 258 0721<br>MIT                                 | 5. Prof Zoe Kourtzi<br>zk240@cam.ac.uk<br>+44 01223 766558<br>University of Cambridge | 6. Prof Simon Baron-Cohen<br>sb205@cam.ac.uk<br>+44 01223 746 057<br>University of Cambridge |