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| Application for CFREF (BrainsCAN) supported MRI Rates at the CFMM |

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| |  | | --- | | Using no more than the space remaining on this page (~300 words), please describe why your imaging project aligns with the themes and goals of BrainsCAN (see [BrainsCAN Research Alignment/Steering Document](http://cfmm.robarts.ca/wp-content/uploads/2017/02/BrainsCAN_Research_Alignment.docx)). Explain the benefits of the reduced rate to your research in terms of the additional scientific avenues you can pursue.  The goal of the current project is to explore whether the process of pattern separation occurs outside of the hippocampus, and whether or not we can use novel multivariate fMRI methods to characterize this process. Pattern separation has been defined as the process of taking highly similar inputs and making them more dissimilar in order to reduce interference amongst stored representations. Previous research has focused on pattern separation as a hippocampal function crucial for retrieving distinct long term memories (i.e., where you parked your car a certain day in the same parking lot you park in everyday). Recently, it has been suggested that pattern separation may be a more general neural function, and may subserve crucial cognitive abilities outside of episodic memory. Our project aims to test this by seeing whether pattern separation occurs in high level visual cortex for object perception. Specifically, we aim to evaluate changes in patterns of activity across voxels evoked by visual objects of varying perceptual similarity.  This project aligns with the strategic priorities of BrainsCAN. Specifically, we will use fMRI methods to characterize a basic neural function (pattern separation) that has largely been investigated in non-human animal studies, and to understand how this function contributes to perception and memory. This gain in basic understanding may aid in better understanding pathology in these regions. Changes in hippocampal-mediated pattern separation abilities have been linked to the development of dementia, but changes in pattern separation outside of the hippocampus in areas that are actually first affected in AD (perirhinal and entorhinal cortex) have not been explored, but could potentially provide more sensitive diagnostic markers.  The reduced rate will allow us to conduct this study with enough power to detect subtle changes in pattern separation throughout the ventral visual stream, and particularly in medial temporal areas that show signal loss due to the susceptibility artifact. | |

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| Contact Information: | |
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| Department: Psychology | Campus Extension: 86299 |
| Date: 06/27/2017 | |

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| |  | | --- | | Please also indicate the following: |  |  | | --- | | Project Name (short title): Pattern separation in object perception | | PI Details (include information regarding prior MRI experience, estimated annual hours needed, expected publications resulting from this project):  PI has 11 years of MRI experience. This project will require 40-50 hours of scanning time this year. 1-2 publications are anticipated to result from this project. |  |  | | --- | | If this study has been peer reviewed by a funding agency, please indicate agency name: n/a | | Was it funded? YES  NO  (Please include the reviews if the application was not funded in order to aid the User Committee in making decisions). |  |  | | --- | | If this project has a training component, list names of trainees (if applicable), type (ie. MSc student, PDF), their prior experience with MRI: Anna Blumenthal (PhD, 5 years of MRI experience), Kayla Ferko (MSc, 1 year MRI experience) | | If this project has a collaborative component, please list collaborating researchers (including their prior level of MRI experience) and affiliations:  Rhodri Cusack (PI, 15 years of MRI experience, Trinity College Dublin), Bobby Stojanoski (Research Scientist, 5 years of MRI experience, UWO), Lisa Saksida (PI, 0 years MRI experience, UWO), Tim Bussey (PI, 0 years of MRI experience, UWO), Chris Martin (Post-doc, 6 years MRI experience, University of Toronto) | | UWO HSREB or AUS approval number: 8182 | | UWO Speedcode: PKJC | |

If awarded the CFREF reduced rate, researchers for each individual project are expected to acknowledge the “Canada First Research Excellence Fund to BrainsCAN” award in all presentations and publications, and to submit a brief report to the CFREF Administrative team ([brainscan@uwo.ca](mailto:brainscan@uwo.ca)) by the end of March in every calendar year ([Annual Report](http://cfmm.robarts.ca/wp-content/uploads/2017/02/CFREF_ReducedRate_AnnualReport.docx)) until the project and all outputs are complete/delivered.

***Methods sections in publications, abstracts and presentations must include a statement that scanning was performed at Western’s Centre for Functional and Metabolic Mapping. Publications neglecting to acknowledge the funding source or CFMM will be retrospectively assessed the standard rate of $450/hr.***

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| Internal Use Only  CFMM User Committee approval: YES  NO | Date: |