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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 purpose of this project is to assess changes in structural and functional integrity of the hippocampus and associated cognitive functions in individuals undergoing Electroconvulsive Therapy (ECT) for treatment of Depression. One mechanism that has been proposed to play a critical role in the therapeutic effects of ECT and other antidepressant treatments is hippocampal neurogenesis. However, most research that speaks to this proposal has been conducted in animals and research evidence in humans is currently very limited. Furthermore, there are other structural and functional changes that have been proposed. In the current study, we will use ultra-high-resolution T1, T2 images and functional (T2\*) images at 7T to comprehensively examine structural and functional components of hippocampal plasticity in relation to ECT treatment (longitudinal design with assessment before and after treatment). The results will provide new insights into the role of hippocampal plasticity in effective treatment of depression with ECT.  This project aligns with the strategic priorities of BrainsCAN. Specifically, we will use high-resolution fMRI methods to assess changes in structural and functional properties of hippocampus after ECT that have not been investigated in previous studies at ultra-high resolution with this combined approach. The project is also clinically significant in understanding the mechanism behind ECT as well as the role of hippocampus integrity in depression and its treatment.  The reduced scanning rate will allow us to collect more data, which will in turn allow greater statistical power to detect differences between depressed patient and healthy controls as well as differences between before and after treatment. It will also allow us to detect differences in sub-regions of hippocampus. Statistical power is of importance to hippocampus, because this region often shows signal loss due to the susceptibility artifact. | | |
| Contact Information: | |
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| Date: 1/18/2018 | |

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| |  | | --- | | Please also indicate the following: |  |  | | --- | | Project Name (short title): Hippocampus ECT | | 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 use 40-50 hrs per year upon full enrollment of the cohorts. 1-2 papers are anticipated from this research. |  |  | | --- | | If this study has been peer reviewed by a funding agency, please indicate agency name: N/A | | Was it funded? YES  NO  (but foundational methodological research at 7T currently funded by CIHR)  (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:  Sudesna Chakraborty (PhD student, 3 years MRI experience); another MSc student to start fall 2018 | | If this project has a collaborative component, please list collaborating researchers (including their prior level of MRI experience) and affiliations:  Dr. Amer Burhan (Western); Dr. Lena Palaniyappan (Western); Dr. Janice Chen (John Hopskins University); Dr. Brian Levine (Baycrest) (All collaborating researchers are experts in MRI) | | UWO HSREB or AUS approval number: 8182 | | UWO Speedcode for billing: RTNQ (Khan/Kohler – Probing hippocampal integrity) | |

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: |