



Frances St. George-Hyslop

CCSF Award Winner 2017-2018, CIBC Scholarship

What makes the human brain unique? This is the fundamental question that Frances St. George-Hyslop, who is pursuing a PhD in Biological Anthropology at the University of Cambridge, hopes to answer. Frances' research aims to uncover why the human brain has evolved to be structurally and functionally distinct from primate brains even though the genome sequence between human beings and other higher primates is 99% identical. A greater understanding of the genetic changes underpinning these differences will provide insight into brain function and, possibly, into neurological conditions affecting higher cognition such as schizophrenia and autism.

Frances' PhD project is unique and idiosyncratic in that it applies insights from evolutionary biology using an experimental approach. She has already broken new ground in initiating an original, inter-disciplinary

collaboration between an experimental centre, the Livesey lab in the Gurdon Institute, with the Kivisild Group in the Department of Biological Anthropology in the Division of Archaeology and Anthropology.

It takes several months to grow the cortical organoid equivalent of a brain. Frances is doing this by applying the experimental expertise of the lab to cultivate human and primate stem cells into cortical organoids. The result of this experiment will be a 3-dimensional *in vitro* model

of the embryonic brain in which the expression of candidate genes can be manipulated. Frances will then study the effects of these gene expressions and correlate the changes in the genetic profile with changes in neurodevelopment between the human and primate brains.

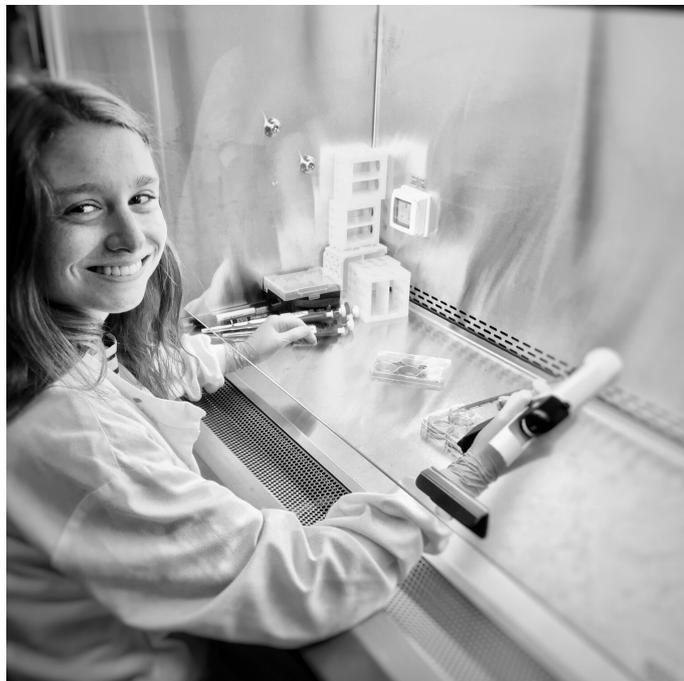
Frances' project is presently in what is called the "bulk neuron growing mode". This summer Frances' will make daily visits to the lab to check on progress, change the growing media and

nurture the cells to a point where the materials are ready for the work on gene expression manipulation.

Even though Cambridge University's intensive three year PhD program demands constant attention and scientific vigilance from its students, Frances is already thinking ahead about how best to capitalise on the insights her project will uncover, whether that is by combining her research experience with a clinical profile, or in further experimental

research and modeling. In addition to her studies Frances is a Coxswain for the St Catherine's College Boat Club. She has also enjoyed getting to know College mates from diverse areas of study including biology, physics and history.

Frances is grateful for the support of the 2017 CIBC award from the CCSF and its recognition of her dedication to uncovering these fundamental secrets of evolution and biology.



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