

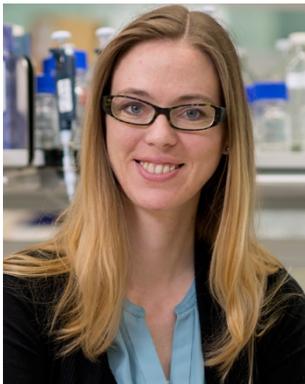


# Yale SCHOOL OF MEDICINE

## GENETICS DEPARTMENT SEMINAR SERIES

# Exploring human brain size determination through the use of neural organoids

The human brain is what makes us human, and so it is natural to wonder what makes it unique. Several qualities set it apart, but the most striking feature is its size. Thus, in order to understand what sets us apart, we must examine the early events in brain development that give rise to the mind-boggling number of neurons within our brains. In an effort to better understand these events, we developed a human model system in a dish, called cerebral organoids. These 3D tissues are generated from human pluripotent stem cells through their neural differentiation and a supportive 3D microenvironment to generate organoids with the same cellular organization of the early human fetal brain. These methods are allowing us to tackle questions previously impossible with more traditional approaches. Indeed, our recent findings provide insight into regulation of brain size and neuron number across species, identifying key stages of early neural stem cell expansion that set up a larger starting cell number to enable the production of increased numbers of neurons. In addition, we are exploring mechanisms of extrinsic regulation of neuron number and brain size, such as through the action of steroid hormones. Overall, our findings are pointing to key, human-specific aspects of brain development and function, that have important implications for neurological disease.



## **Dr. Madeline A. Lancaster, PhD**

MRC Investigator

MRC Laboratory of Molecular Biology, Cambridge, UK

### **Host: Dr. In-Hyun Park, PhD**

Associate Professor

YSM Department of Genetics

**Tuesday, November 16, 2021**

11:30am - 12:30pm

**[Zoom Link](#)**

**pw: 473124**

The Genetics Calendar of Events can be viewed on-line at  
<https://medicine.yale.edu/genetics/events/seminars.aspx>