

Introduction to Imaging Genetics

Organizers:

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This course will introduce the fundamentals of “Imaging Genetics,” the process of modeling and understanding how genetic variation influences the structure and function of the human brain as measured through brain imaging. The course begins with a brief history of imaging genetics, including discussion on replicability and significance thresholds. Then, we will discuss endophenotypes including modern methods for assessing heritability and genetic correlation. We will cover datasets and methods for conducting common and rare variant associations, as well as bioinformatic tools to interpret significant findings. We will also cover two nascent and related fields: imaging epigenetics and relating gene expression networks to brain structure and function. Overall this course will provide the neuroimager who is not familiar with genetics techniques an understanding of the current state genetics field when exploring neuroimaging phenotypes.

Course Schedule:

8:00-8:30

A brief history of imaging genetics

Jean-Baptiste Poline, Ph.D., University of California, Berkeley, Berkeley, CA, United States

8:30-9:00

The modern day endophenotype

Roberto Toro, PhD, Institut Pasteur, Paris, France

9:00-9:30

Utilizing big datasets in imaging-genetics

Derrek Hibar, Institute for Neuroimaging & Informatics, Los Angeles, United States

9:30-10:00

Imaging Epigenetics

Sylvane Desrivieres, King's College London, London, United Kingdom

10:00-10:15

Break

10:15-10:45

Networks of gene expression and brain function

Vilas Menon, PhD, HHMI Janelia Research Campus, Ashburn, VA, United States

10:45: 11:15

Rare variant associations

David Glahn, Yale University, Hartford, United States

11:15-11:45

After the association

Jason Stein, PhD, University of North Carolina at Chapel Hill, Chapel Hill, NC, United States

11:45-12:00

Question and Answer