Identifying the Structural Changes in the Brain Caused by Childhood Depression

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Adolescent MRI Trials and Diagnosis Algorithm

- At the beginning of study, 1000 10-year old children will be recruited
  - Approximately 250 depressed males, 250 healthy males, 250 depressed females, and 250 healthy females
- Scans will be taken biannually for 10 years, for a total of 20,000 MRI scans
  - These scans will be used to train a Random Forest Classifier that will identify the formation of depression in adolescents
- Every year, the scans of depressed males, healthy males, depressed females, and healthy females will be averaged for a total of 4 averaged MRIs per year
  - These averaged images will help researchers identify the structural changes in the brain caused by the onset of depression

Adult MRI and EM Trials

- MRI scans on a randomly selected group of 60 adult patients
  - Approximately 20 adults who acquired child-onset depression
  - 20 adults who acquired adult-onset depression
  - 20 adults who are normal
- Conduct MRI image analysis to compare structural brain areas acquired by depression between childhood and adulthood depression.
  - Provides insight into long-term development of depression
  - Evaluates potential differences in brain structure between childhood-onset and adult-onset depression.
- Volumetric segmentation of EM data will be conducted on only a few patient brain tissues gathered from brain surgeries
  - EM allows us to understand the brain at the synaptic level in order to better understand depression at the cellular and molecular level.

Budget

MRI scans	$1000 per scan	20.1 million
EM scans		2 million
Data storage/upload (e.g. Google Cloud)	0.026 (upload) + 0.08 (download) per GB per month	6.4 million
Hired research personnels	Upper bound of 30 full-time research staff	35.5 million
Basic lab setup and equipment	Includes basic lab equipment and lab information system	0.4 million
Compensation for voluntary subjects	$200 per volunteer subject	0.1 million
TOTAL		**64.5 million**

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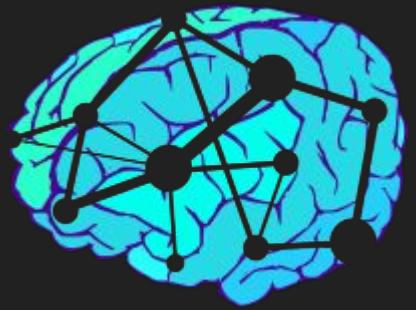
NIH National Institute of Mental Health



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