

Advanced Methods for Preclinical Alzheimer Research

Jan 21- Feb 2, 2019

Preliminary list of mini-projects

Period 1: Jan 22-26

	Topic	Methods covered	Area
1	Behavioral study of mouse models of AD	Behavior Y-Maze, Morris Water Maze, Elevated Plus Maze	Behaviour
2	Studying mitochondria-ER contacts in Alzheimer's disease (AD)	Biochemistry, subcellular fractionation, confocal microscopy, Ca ²⁺ imaging in slices	Biochemistry
3	Proteomics at single cells or a specific tissue in AD samples	Laser microdissection, biochemistry, Mass spectrometry	Biochemistry
4	Study of synaptic proteins with biochemistry and superresolution microscopy in AD mouse models.	Biochemistry, immunohistochemistry, confocal and STED imaging of brain sections.	Cellular imaging
5	Morphometric analysis of neuronal alterations in models of AD	Episcope, confocal, STED, spinning disk, image quantification	Cellular imaging
6	Electrophysiological consequences of Tau mutations in the hippocampus	Stereotaxic injections, patch-clamp recordings in slices, IHC and confocal microscopy	Electrophysiology
7	Gene transfer and in vivo administration in the brain of AD mouse models	Stereotaxic viral injection, mouse surgery, intraventricular drug delivery, histology	In vivo
8	In vivo 2-photon imaging of neuronal activity in a model of neuroinflammation and tauopathy	In vivo 2P functional and structural imaging, surgery and mouse preparation.	In vivo
9	Hippocampal and cortical atrophy during the preclinical stage of AD	Structural neuroimaging	Human neuroimaging
10	IPSCells		Human cells
11	Drosophila as a model of neurodegenerative diseases	Drosophila	In vivo

Period 2: Jan 28-Feb 2

	Topic	Methods covered	Area
1	Behavioral study of memory in mouse models of AD	Behaviour, pharmacological intervention	Behaviour
2	Study of biomarkers from CSF, AD patients	Biochemistry, proteomics	Biochemistry
3	Synaptic proteins in WT vs AD mouse models	Biochemistry, subcellular fractionation, primary cultures, confocal microscopy	Biochemistry
4	High content fluorescence imaging in brain sections.	Histology and immunohistochemistry, wide-field and confocal imaging, image analysis	Cellular imaging
5	Mitochondria distribution the organotypic slices in control and in a tau-seeding model	Confocal microscopy, STED, spinning disk, image quantification	Cellular imaging
6	Episodic memory, electrophysiological characterization of engram cells.	behavior, contextual fear conditioning, histology, in vivo viral infection, immunohistochemistry, slice electrophysiology	Electrophysiology
7	Generation of new C. Elegans transgenics as AD model	C.Elegans - molecular biology	In vivo
8	Mouse EEG analysis or microPET / autoradiography analysis	Electrode implantation, in vivo electrophysiology.	In vivo
9	Structural and fonctionnal brain imaging in AD patients		Human Neuroimaging
10	electrophysiology	Slice electrophysiology	Electrophysiology
11	IPSCells?		Human cells