

# Fiche UE M2 MU5BIN18

## NOVEL TECHNOLOGIES APPLIED TO HUMAN NEUROPATHOLOGIES

<b>Lead</b>	Hélène Cheval					
<b>Co-lead</b>						
<b>Description</b>	<i>Parcours type</i>	<i>Option</i>	<i>Level</i>	<i>Semester</i>	<i>ECTS</i>	<i>Effectif maximal</i>
	Neurosciences	Integrated Cellular Neurosciences - iMIND	M2	S3	6	20
<b>Course structure</b>	<i>Hours Lectures</i>	<i>Hours TD</i>	<i>Hours Practicals</i>	<i>In class/Distance</i>		
	50			In class : 100%		
<b>Goals</b>	<p>This UE provides an overview of the latest methodological approaches used to study in an integrative way the molecular and cellular mechanisms associated with neuronal functions and dysfunctions. Four main technological domains will be tackled:</p> <ol style="list-style-type: none"> <li>1) Omics (transcriptomics, epigenomics, proteomics)</li> <li>2) Stem cell research (iPS cells, 2D and 3D cultures, neuronal differentiation)</li> <li>3) Imaging (multiscale; 2D ; 3D with clearing approaches, EM)</li> <li>4) Electrophysiology (<i>in vivo</i>, <i>in vitro</i>, Multielectrode Array)</li> </ol>					
<b>Themes</b>	<ul style="list-style-type: none"> <li>- Theoretical bases underlying the main techniques addressed in this course.</li> <li>- Visits of technological platforms of the ICM.</li> <li>- How to choose and combine technological strategies to answer scientific questions? Research projects associated with neurodegenerative diseases (Parkinson's Disease, Alzheimer's Disease, ALS, MS), as well as other human pathologies (neurodevelopmental diseases, epilepsy, addiction, cancer) will be tackled.</li> <li>- Ethical considerations regarding these new methodological approaches.</li> </ul>					
<b>Competencies acquired upon completion of the course (concepts, methodology and tools)</b>	<p>Understand the most recent approaches to study cellular and molecular mechanisms underlying human diseases  Gain knowledge on the scientific advances in these fields  Acquire the methodological procedures (advantages and drawbacks of different approaches) to answer a specific scientific issue  Develop critical thinking regarding an experimental design, results and literature  Develop analysis and synthesis skills</p>					
<b>Prerequisite</b>	M1 neurosciences or equivalent/ Electrophysiology refresher course S. Charpier M2S3					
<b>Evaluation/100</b>	<i>Written</i>	<i>Oral</i>	<i>CC</i>	<i>Other</i>		
	70	30				
<b>Languages used</b>	<i>In class</i>			<i>In documents, educational supports</i>		
	English			English		
<b>Location</b>	ICM/ Sorbonne Université					