

## BP21 NANOBIOTECH: BIOSENSORS AND NANODELIVERY SYSTEMS

ECTS	Cours/Lectures (h)	T.D./Exercices (h)	T.P. /practical Classes (h)	Stage/Training (semaines/weeks)	Projet/project (h)
<b>4 (40h)</b>	<b>34</b>		<b>6</b>		

Département / parcours, (Department / speciality) :	Responsable de l'UE (TU responsive):	Statut/Status	Institution
BP COMMON	FR : Benoit PIRO VN : NGUYEN Thi Lap	PR DR	Paris Diderot Hanoi University of Pharmacy

### PROGRAMME DE L'UNITE D'ENSEIGNEMENT :

**Biosensors technology:** DNA microarray, peptide and protein –soluble or not soluble- analysis chips, and cell analysis biochips. The course will permit to deepen some of the main physical or biophysical principles used for the fabrication and use of these biosensors:

Fabrication principle of DNA microarrays

Soluble protein or peptide biochips

-----→2D electrophoresis

-----→Mass spectrometer coupling

-----→peptide microarrays – surface functionalization aspects

Membrane protein biochips

-----→Planar patch clamp technology

-----→miniaturization and noise

Cell biochips

-----→Cell sorting using DEP, or microfluidic principles

-----→Cell detection and analysis using impedancemetry

-----→Ampérometric detection on a chip – advantage of miniaturized electrodes

**Nanobiotechnologies;** characterization, design and application and to clarified the potential of nanotechnology in diagnosis and therapy

Intracellular engineering at nanometer scale; e.g. cellular machineries

Nanoimaging in biology and medicine

Nanoparticles and diagnosis

Biosensors

Liposomes as pharmaceuticals carriers

Labchips and diagnosis

Nanomedicine and cancer

### Modalités d'évaluation / Examination forms

(Indiquer le coefficient si plusieurs modalités  
d'évaluation / please precise the ration if there  
are different examination forms)

<input type="checkbox"/> Interrogation(s) orale(s) / oral interview	<input type="checkbox"/> Rapport / mémoire / repport	<input type="checkbox"/> Exposé(s) / talk
<input type="checkbox"/> Examen(s) écrit(s)/	<input type="checkbox"/> Compte-rendu(s) de travaux pratiques / practical classe repport /	<input type="checkbox"/> Poster
<input type="checkbox"/> Soutenance de stage ou projet / training or project defense	<input type="checkbox"/> Logiciel / Software	
<input type="checkbox"/> Note de déroulement de stage / training mark	<input type="checkbox"/> Autre / another:	

***IMPLICATION DE COMPAGNIES PRIVEES : INVOLVMENT OF PRIVATE COMPAGNIES :***

Des contacts seront pris avec les principales sociétés fournisseuses de réactifs et instruments de biologie moléculaire et Biochimie (Invitrogen, GE-Healthcare ...). Main supplier companies of Molecular Biology and Biochemistry reactivities and instruments will be contacted.