



Master Biologie Moléculaire et Cellulaire 'BMC',  
Université de Paris - UFR Sciences du Vivant

Parcours : **Biologie et Développement Cellulaires 'BDC'**

<http://www.master2bdc.fr/>

Fiche de Projet de Stage M2, Année 2021-2022

<p><b>Unité INSERM ou CNRS ou Université :</b> <a href="#">Inserm U1151/CNRS UMR 8253,</a> <a href="#">Institute Necker Enfants Malades (INEM)</a></p> <p><b>Intitulé Equipe :</b> Team17: Laboratory of Nutrient Sensing Mechanisms; <a href="http://www.panasyuklab.fr">www.panasyuklab.fr</a></p> <p><b>ED d'appartenance :</b> BIOSPC (ED 562)</p> <p><b>Responsable de l'Equipe :</b> <a href="#">Dr. Ganna PANASYUK</a></p>	<p><b>Responsable du Stage :</b> <a href="#">Dr. Ganna PANASYUK</a></p> <p><b>Contacts</b></p> <p>Adresse : <a href="#">156-160 Rue Vaugirard,</a> <a href="#">Paris 75015, France</a></p> <p>Email : <a href="mailto:ganna.panasyuk@inserm.fr">ganna.panasyuk@inserm.fr</a></p> <p>Tel : 0033 1 40 61 53 44</p>
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**Titre du projet : Novel roles of class 3 PI3K for assuring metabolic fitness**

### Résumé du Projet de Stage

Our team addresses these fundamental questions: How do cells adapt their metabolism to survive in different nutrient environments? And how defects in these mechanisms could be explored to understand and to treat human diseases?

We focus on an essential **nutrient sensing signal transduction** pathway present in all eukaryotic cells, the Vps15/Vps34 complex (Vacuolar Protein Sorting 15/34, known as **class 3 PI3K**). Its best-known cellular roles rely on its lipid kinase activity for production of PI3P to drive cellular processes of endocytic trafficking and autophagy. Our team has shed the light on its in vivo importance by showing that class 3 PI3K is required to maintain whole body **metabolic homeostasis**, and recently demonstrated its essential function in **transcriptional control** of lipid metabolism (1, 2, 3). In our on-going project, we focus on the novel nuclear roles of class 3 PI3K for assuring metabolic fitness of the cells, the process challenged during organismal aging. Our unpublished RNA-seq, ChIP-Seq and nuclear interactome data have suggested novel functional links between class 3 PI3K and life sustaining amino acid metabolic pathways. The main objectives of this M2 training that we are determined to lead to an ambitious PhD project are: **1)** To characterize the metabolic signals that mediate novel interactions between class 3 PI3K and amino acid metabolism; **2)** To demonstrate functional significance of these novel molecular cross-talks for cell survival.

We are looking for an enthusiastic and ready-to-learn, scientifically driven trainee with a strong interest in signal transduction mechanisms and not shy of learning about metabolism. Our international laboratory ([www.panasyuklab.fr](http://www.panasyuklab.fr)) belongs to the Institute Necker Enfants Malades which is located at the heart of the world-renowned Necker Hospital research campus in a central Paris. You will be trained in a highly dynamic and scientifically stimulating French/English working environment. You will benefit from weekly seminars and interactions with scientists coming from all over the world.

### Publications de l'équipe relatives au projet de stage (max 5)

- 1) Iershov A, ...**Panasyuk G** The class 3 PI3K coordinates autophagy and mitochondrial lipid catabolism by controlling nuclear receptor PPAR $\alpha$  *Nat. Comm.* 2019 Apr 5;10(1):1566
- 2) Nemazanyy I, ...**Panasyuk G**. Class III PI3K controls hepatic insulin receptor function on whole body glucose homeostasis by a retrograde signalling mechanism. *Nat. Comm.* 2015; 6:8283
- 3) Nemazanyy I, ...**Panasyuk G**. Defects of Vps15 in skeletal muscles lead to autophagic vacuolar myopathy and lysosomal disease. *EMBO Mol Med.* 2013; 5(6):870-90