SÉMINAIRE


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**Equipe « Modifications post-traductionnelles des protéines et réparation de l'ADN : structure, fonction et dynamique »**


# PROTEIN:NUCLEIC ACID INTERACTIONS AND PTMs IN FUNDAMENTAL BIOLOGY: STUDYING TRANSLATION INITIATION AND NUCLEOSOME SUMOYLATION


Across evolution, the fidelity of biochemical reactions is maintained by highly conserved factors like nucleic acids and proteins. Their dynamic inter actions orchestrate gene expression where each step of the central dogma (transcription, RNA processing, translation, and post-translational modification) is tightly regulated to ensure fidelity. The coordinated binding of mRNA, rRNA, and tRNA with ribosomal proteins is very critical for accurate protein synthesis during translation. The post-translational modifications (PTMs) also play major roles by fine-tuning protein activity, ensuring correct localization, and removing faulty proteins. In addition to gene expression, a key aspect of all living organisms is maintaining genome integrity through sensing and resolving DNA damage. In eukaryotic cells, nucleosome is a key unit that packages, protects, and regulates expression and repair of genetic information. Nucleosomes are regulated by a variety of PTMs targeting histone proteins. In this seminar, I will present both my previous doctoral work on translation initiation in yeast model system and my current work on nucleosome regulation through a PTM called SUMOylation in eukaryotes. Unlike acetylation or methylation of histones, which directly modulate chromatin accessibility, nucleosome SUMOylation primarily acts by recruiting DNA repair and chromatin remodeling proteins to specific genomic sites. Our in vitro approach by reconstituting the complex will reveal the functional and structural significance of SUMOylation in regulating the nucleosome structure, accessibility, and interactions. The project sheds new light on how these fundamental factors are regulated in the context of gene expression and DNA repair. This study highlights how protein:protein and protein:nucleic acid interactions combine with covalent protein modifications to regulate fundamental biological processes.


**Vendredi 12 septembre 2025 à 11h00**

**CBM - Salle Luciole**

**Rue Charles Sadron - 45000 Orléans**