Three PhD positions available in Montpellier, France
LabMUSE EpiGenMed Collaborative PhD Training Network

Role of DNA secondary structures in genome regulation

Up to recently, DNA structures alternative to B DNA were essentially studied in vitro. Recent advances have shown that some of these structures, called G-Quadruplexes (G4s), are likely to be formed in genomic DNA and play an essential role in processes such as transcription, replication and DNA repair. Specifically, our recent evidence indicates that G4s could strongly contribute mammalian promoter identity and activity, but the mechanism by which G4 modulate transcription remains unknown.

We have built a consortium of three laboratories in Montpellier and are hiring three PhD students to study the role of G4s in transcription. We will tackle this question using state-of-the-art, complementary approaches, including systems biology, functional genomics, quantitative proteomics, CRISPR-Cas9-based gene editing and bioinformatics. The work will be performed in each lab, according to their expertise, and progress will be coordinated between the three groups and PhD students. The tight connection between members of the network will provide unique training opportunities for each PhD student, such as learning about ChIP-seq, RNA-seq, genome-scale promoter assays, affinity purification coupled to mass spectrometry, degron approaches for functional studies. PhD students will also have the opportunity to attend workshops and training programs from the University. Among those, a bioinformatics workshop will provide strong bases for ChIP-seq, RNA-seq and Hi-C data analyses.

We are searching for highly motivated and enthusiastic students with interest in the field of chromatin and transcription regulation and System Biology. Send application letter, CV including 2 referees to JC Andrau (jean-christophe.andrau@igmm.cnrs.fr), Dom Helmlinger (dominique.helmlinger@crbm.cnrs.fr) and Guillaume Cambray (guillaume.cambray@cbs.cnrs.fr). PhD should start in the fall 2021. The PhD will be funded via an iMUSE site of excellence fellowship. Applicants will also have to apply to the Epigenmed-Labmuse initiative through a selective process at the following address: https://questionnaire.umontpellier.fr/index.php/774212?lang=en
Further information on the Epigenmed networks can be found at
https://filesender.renater.fr/?s=download&token=9dc97060-c53a-4a54-b73a-b6be13b85690

Recent references from the labs:

Alternative Enhancer Usage and Targeted Polycomb Marking Hallmark Promoter Choice during T Cell Differentiation. Maqbool MA, Pioger L, El Aabidine AZ, Karasu N, Molitor AM, Dao LTM, Charbonnier G, van Laethem F, Fenouil R, Koch F, Lacaud G, Gut I, Gut M, Amigorena S, Joffre O, Sexton T, Spicuglia S, **Andrau JC. Cell Rep. 2020** Aug 18;32(7):108048.

Tyrosine-1 of RNA Polymerase II CTD Controls Global Termination of Gene Transcription in Mammals. Shah N, Maqbool MA, Yahia Y, El Aabidine AZ, Esnault C, Forné I, Decker TM, Martin D, Schüller R, Krebs S, Blum H, Imhof A, Eick D, **Andrau JC. Mol Cell. 2018** Jan 4;69(1):48-61.e6.

Chaperone-mediated ordered assembly of the SAGA and NuA4 transcription co-activator complexes in yeast. Elías-Villalobos A, Toullec D, Faux C, Séveno M, **Helmlinger D. Nat Commun. 2019** Nov 20;10(1):5237.

Evaluation of 244,000 synthetic sequences reveals design principles to optimize translation in Escherichia coli. **Cambray G**, Guimaraes JC, Arkin AP. **Nat Biotechnol. 2018** Nov;36(10):1005-1015.