

BCH 252 Seminar Series



Dr. Oliver Bell, Assistant Professor, Departments of Biochemistry and Molecular Medicine, Stem Cell and Regenerative Medicine, Keck School of Medicine of the University of Southern California

Seminar Title: "Epigenetic regulation of cell identity in development and disease"

Abstract: We are fascinated by the epigenetic mechanisms that underlie the regulation of cellular identity. How do epigenetic mechanisms contribute to establishment and maintenance of cell-type specific gene expression programs? How are epigenetic chromatin modification dynamically regulated in development and how do they go awry in disease. What are entry points for therapeutic interventions? To tackle these questions, we use genetic and genomic strategies in embryonic stem cells and cancer cell models¹. In addition, we apply innovative chemical biology approaches which enable reversible targeting of epigenetic regulators to directly interrogate their functions in transcriptional gene regulation of mammalian cells². This reductionist approach to recapitulate physiological chromatin landscapes offers a unique entry point to use genetic and pharmacological tools to dissect the mechanism of epigenetic regulation³⁻⁵. As key regulators of this process have been implicated in tumorigenesis, we believe that elucidating the molecular underpinnings of normal and aberrant chromatin regulation is critical on the path to developing effective clinical therapies.

Recent Lab Publications:

1. Zepeda-Martinez, J.A., et al. (2020). Parallel PRC2/cPRC1 and vPRC1 pathways silence lineagespecific genes and maintain self-renewal in mouse embryonic stem cells. *Sci Adv* 6, eaax5692.
2. Moussa, H.F.H.F., Bsteh, D., et al. (2019). Canonical PRC1 controls sequence-independent propagation of Polycomb-mediated gene silencing. *Nat Commun* 10, 1–12. [10.1038/s41467-019-09628-6](https://doi.org/10.1038/s41467-019-09628-6).
3. Lamb, K.N., et al. (2019). Discovery and Characterization of a Cellular Potent Positive Allosteric Modulator of the Polycomb Repressive Complex 1 Chromodomain, CBX7. *Cell Chem Biol* 26, 1365-1379.e22. [10.1016/j.chembiol.2019.07.013](https://doi.org/10.1016/j.chembiol.2019.07.013).
4. Suh, J.L., et al. (2021). Reprogramming CBX8-PRC1 function with a positive allosteric modulator. *Cell Chem Biol*, 2021.02.23.432388. [10.1016/j.chembiol.2021.10.003](https://doi.org/10.1016/j.chembiol.2021.10.003).
5. Yelagandula, R., Stecher, K., et al. ZFP462 safeguards neural lineage specification by targeting G9A/GLP-mediated heterochromatin to silence enhancers. *Nature Cell Biology* 10.1038/s41556-022-01051-2.

Tuesday, June 6th, 2023 | 12:00 p.m. - 12:50 p.m. PST

In-Person: Genomics Auditorium 1102A

Host: Dr. Maria Ninova