



DEPARTMENT OF BIOCHEMISTRY FACULTY RECRUITMENT CANDIDATE SEMINARS:

Assistant Professor in Biochemistry



Benjamin Donovan, Postdoctoral Fellow, National Cancer Institute/National Institutes of Health (NIH)

Research Seminar:

Tuesday, January 7, 2025 | 12:00 p.m. – 1:00 p.m.

Seminar Title: "Real-Time Visualization of Spliceosome Assembly Reveals Basic Principles of Splice Site Selection"

Abstract: Despite being studied for over 40 years, there are still major open questions related to how the spliceosome accurately selects splice sites amongst a vast pool of highly similar non-functional sites. For example, while the 3' splice site (3'SS) is initially recognized by the U2AF heterodimer, it is well known that U2AF binds pervasively throughout a pre-mRNA. In this seminar, I will discuss how we developed a kinetic model of splice site selection based on single-molecule imaging of the U2AF heterodimer *in vitro* and *in vivo*. The model successfully predicts splicing patterns for groups of similar 3'SSs and indicates that 3'SS selection occurs while U2AF is in complex with the spliceosome, not during initial binding. We therefore identified proteins that interact with U2AF during spliceosome assembly to influence splice site selection, uncovering a role for the poorly understood RNA helicase DDX42 in accelerating U2AF dissociation while in complex with the spliceosome. In addition to measuring the time scales of the earliest steps of spliceosome assembly, this work establishes how the spliceosome achieves high specificity to bona fide splice sites while still allowing for efficient forward progression.

Biography: Ben Donovan is a postdoctoral fellow in the Laboratory of Receptor Biology and Gene Expression at the National Cancer Institute. As a member of Dan Larson's Systems Biology of Gene Expression Group, he is studying the role of RNA binding proteins in the timing and location of spliceosome assembly. He graduated from The Ohio State University with a PhD in Biophysics where he used single-molecule approaches to probe the mechanisms by which transcription factors gain access to their sites in chromatin.

In-Person Seminar Location: Genomics Auditorium 1102A

ZOOM Link for Seminar: <https://ucr.zoom.us/j/91871514563>

Meeting ID: 918 7151 4563 | **Passcode:** 693602

Host: Dr. Jikui Song