12th Annual Winter qBio Conference: Abstract Submission Guidelines

Following the guidelines below, abstracts should be submitted as .pdf files **[Lastname-Firstname.pdf]** via the online submission form located at https://www.w-qbio.org/present.

TALK ABSTRACT DEADLINE: **Friday, November 22, 2024** @ 11:59 PM.

In order to present a poster or give a talk, you must also register for the conference. Registration information can be found at https://www.w-qbio.org/register.

Abstract Guidelines:
1) Abstract Title: Arial, Bold, 12 pt., centered. Maximum of 150 characters, including spaces.
2) Abstract Authors: Arial, 12 pt., centered. Include, all authors full name and affiliation. Use superscript to indicate multiple or varying affiliations.
3) Authors Address(es): Arial, 11 pt., justified.
4) TEXT ONLY abstract: Arial, 12 pt., justified. Maximum of 500 words.

PROPERLY FORMATTED ABSTRACT EXAMPLE:

NFκB Signaling in a Dynamic Microfluidic Environment

Martin Kolnik[1,5,*], Jangir Selimkhanov[1,5,*], Alex Hoffmann[2,5], Jeff Hasty[1,3,4,5], and Lev S. Tsimring[4,5]

[1] Department of Bioengineering, UCSD, 9500 Gilman Drive, La Jolla, CA 92093
[2] Department of Chemistry and Biochemistry, UCSD, La Jolla, CA
[3] Molecular Biology Section, Division of Biological Sciences, UCSD, La Jolla, CA
[4] BioCircuits Institute, UCSD, La Jolla, CA
[5] The San Diego Center for Systems Biology, La Jolla, CA

Nuclear factor kappa B (NFκB) is a well-studied global regulator of gene expression that coordinates the cellular response to a variety of external stimuli such as tumor necrosis factor alpha (TNFα), which is critical in inflammation and immunity. NFκB is normally sequestered in the cytoplasm but it translocates into the nucleus upon TNFα stimulation and acts to regulate a variety of downstream genes before it is shuttled out of the nucleus back into the cytoplasm. Oscillation dynamics of NFκB shuttling have been implicated in the functional dynamics of subsequent gene expression but it remains to be determined to what extent dynamic stimulation of the system affects nuclear-cytoplasmic NFκB shuttling. To this end, we have developed a microfluidic cell culture device to stimulate mammalian cells with any desired time-varying waveform of biochemical inducer while maintaining the cells in a zero-shear environment. By delivering TNFα in a ramp versus step waveform we are able to gain insight into the dynamics of NFκB activation. Using our recently developed automated tracking of individual cells, we can gather relevant statistical data on the NFκB response dynamics. Our preliminary results indicate that the strength and timing of initial NFκB response is variable between cells, which we can observe due to the dynamic ramp TNFα activation experiments. This variability would be difficult to detect in devices where only static delivery of TNFα is possible.

* Equal contributions