THE UNIVERSITY OF ARIZONA
COLLEGE OF ENGINEERING
Biomedical Engineering

DEPARTMENT OF BIOMEDICAL ENGINEERING SEMINAR SERIES

PRESENTS

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"Stop making waves: A new regulatory role for cardiac myosin binding protein-C in damping contractile oscillations"

ABSTRACT: Cardiac myosin binding protein-C (cMyBP-C) is a critical regulator of heart muscle contraction that is phosphorylated by adrenergic stimuli ("fight-or-flight" responses), whereas mutations in MYBPC3, the gene encoding cMyBP-C, are the most frequent cause of hypertrophic cardiomyopathy (HCM). However, the mechanisms by which cMyBP-C affects cardiac contraction are complex and only partly understood. A primary obstacle has been the lack of methods to rapidly modify cMyBP-C at its position in sarcomeres in situ. To overcome this obstacle, we designed a novel hybrid genetic/protein engineering approach to efficiently "cut and paste" cMyBP-C at its native location in sarcomeres. Results using this new method showed that loss of cMyBP-C ("cut") caused sustained auto-oscillatory contractions when detergent permeabilized myocytes were activated by submaximal [Ca2+]. Ligation ("paste") of new recombinant cMyBP-C abolished the oscillations, but phosphorylated cMyBP-C did not. These results suggest a previously unrecognized role of cMyBP-C in damping sarcomere-generated contractile waves in a phosphorylation dependent manner and a new regulatory role for oscillatory contractile waves in mediating cardiac responses to adrenergic stimuli.

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Please join us on

Monday, September 30th, 2019
12:00-12:50 pm, Keating Bldg., Room 103
Refreshments will be available at 11:50 am

Hosts: Drs. DK Kang and Minkyu Kim
dkkang@email.arizona.edu & minkyukim@email.arizona.edu

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