



University of Stuttgart

Stuttgart Research Center Systems Biology (SRC SB)



Systems Biology Seminar Talk

Mechanosensitive and spatially confined dynamics in biological systems

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16.10.2023
14:00 CET

Lecture Hall 0.106
Allmandring 31
Stuttgart

Abstract:

Many processes in nature are controlled by interactions with the immediate environment. In biological systems, these interactions are important to ensure developmental processes and the maintenance of vital functions. External signals and physical structures can regulate biological functions of cells. An external signal can be a stimulus from the environment in molecular or energetic form. Physical structures, such as surrounding cells, inorganic materials or even intracellular biomineralized structures, are mostly in direct contact with cells and may activate mechanosensitive regulatory mechanisms, and are crucial to ensure cross-scale biological processes.

In this talk, I will give an overview of biophysical processes in several scale-spanning mechanosensitive and spatially confined biological systems, starting from complex tissues down to single molecular dynamics. I will give insights in how mechanosensitivity regulates heart tissue and muscle cell dynamics, how the size, shape and curvature of membranes dictate the dynamics of signalling lipids, and fundamental insights in how even single cell organisms use mechanical cues for the self-ensemble of biomineralized structures.

CV:

- Since 2016: Team leader, IBBS, University of Stuttgart, Germany
- 2014 – 2016: Assistant Professor, iCeMS, Kyoto University, Kyoto, Japan
- 2013 – 2016: Lecturer, Doshisha University, Kyoto, Japan
- 2012 - 2013: FBR-Fellow/Postdoc., RIKEN - Center for Developmental Biology, Kobe, Japan
- 2010 - 2012: JSPS-Fellow/Postdoc., Kyoto University, Kyoto, Japan
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- 2003 - 2005: Diplom, Physics, Potsdam University, Potsdam, Germany
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