



Through Inspiration, Discovery

King Abdullah University of Science and Technology

### **PhD position: Role of epigenetic memory system in circadian clock regulation**

The majority of our physiological and metabolic processes are coordinated by an internal clock, which has evolved as an adaptive response to the daily light-dark cycles. Thus, several physiological and behavioral activities display an oscillatory rhythmic period of 24 hours. This highly conserved molecular mechanism is achieved through a specific program of gene expression, characterized by a crosstalk between clock-core proteins, chromatin remodelers and energy metabolism contributing to the oscillatory nature of circadian transcriptional activity in the genome. Recent evidence revealed that each cell and organ have an intrinsic clock and that coordination between central versus peripheral clocks is key for health. The underlying epigenetic mechanisms that regulate the intrinsic clock and integration/interdependence on the other clocks of other organs are unexplored.

The project, performed in collaboration with Paolo Sassone-Corsi's lab (UCI, Irvine), aims to investigate the role of chromatin cell memory mechanisms in intrinsic clock transcriptional regulation and their functional interplay with other central clock genes. The study builds on a previously reported novel mechanistic role of Polycomb group proteins (PcG) mediated cell memory system and in particular the PRC2-Ezh1 complex, in supporting adaptive stress response in post-mitotic skeletal muscle cells (*Bodega et al, Nature SMB 2017; Liu et al Epigenetics and Chromatin 2019*). We will take advantage of an exclusive genetically modified mouse model system in which the clock of each individual tissue can be investigated separately or in combination. The outcome of this study will shed light on novel fundamental mechanistic aspects underlying circadian clock regulation, possibly relevant for associated high societal impact diseases.

Candidates should be familiar with Molecular and Cellular Biology technologies. PhD training will include also the use of mouse models, epigenomics and metabolomics. The position is immediately available. Net yearly salary is 45.000 USD, plus housing and travel benefits.

**For inquires please contact:**  
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