

SFB 960-/BZR – Kolloquium

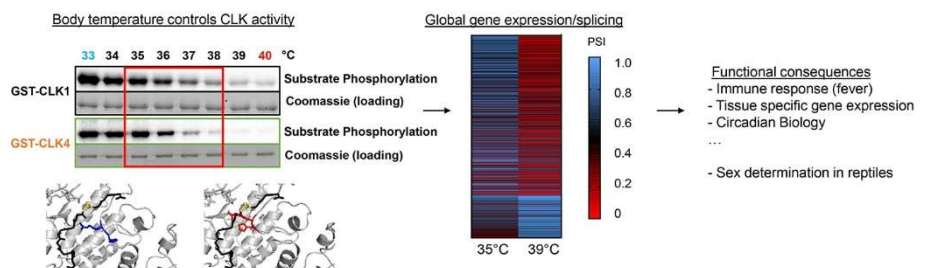
30. Januar 2019, 14.00 Uhr
H53



Prof. Dr. Florian Heyd Freie Universität Berlin

Some like it cold: (Body)temperature-controlled kinase activity in circadian biology, sex determination and beyond

Homeothermic organisms maintain their core body temperature in a narrow, tightly controlled range. Whether and how subtle circadian oscillations or disease-associated changes in core body temperature are sensed and integrated in gene expression programs remains elusive. Furthermore, a thermo-sensor capable of sensing the small temperature differentials leading to temperature-dependent sex determination (TSD) in poikilothermic reptiles has not been identified. Here we show that the activity of CDC-like kinases (CLKs) is highly responsive to physiological temperature changes, which is conferred by structural rearrangements within the kinase activation loop. Lower body temperature activates CLKs resulting in strongly increased phosphorylation of SR-proteins in vitro and in vivo. This globally controls temperature-dependent alternative splicing and gene expression, with wide implications in circadian, tissue-specific and disease-associated settings. This temperature sensor is conserved across evolution and adapted to growth temperatures of diverse poikilotherms. The dynamic temperature range of reptilian CLK homologs suggests a role in TSD.



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