A KJELDGAARD LECTURE

Wednesday 11 September 2019 at 13:15
1593-012 Aud. (iNANO)
Same location for the PhD session

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Body temperature controlled kinase activity: from rhythmic alternative splicing in mammals to sex determination in reptiles

Endothermic organisms maintain their core body temperature in a narrow range with subtle circadian oscillation, tissue-specific differences or alterations in pathological conditions. In contrast, ectotherms adapt to the external temperature, which, in some reptiles, induces temperature-dependent sex determination. However, a molecular thermometer that is able to sense small changes in temperature has remained elusive. Here we show that the activity of CDC-like kinases (CLKs) is highly responsive to physiological temperature changes. Lower body temperature activates CLKs, resulting in strongly increased phosphorylation of SR-repeats, with wide implications for circadian, tissue-specific and disease-associated alternative splicing and pre-mRNA processing. Temperature sensitivity is conferred by conformational changes in the activation loop, which at higher temperature blocks substrate access to the active center. CLK temperature-sensitivity is conserved across evolution and adapted to growth temperatures of diverse ectotherms. Interestingly, the dynamic temperature range of reptilian CLK homologs suggests a role as molecular thermometer controlling temperature-dependent sex determination.

Host: Ulf Andersson Ørom, Gene Expression & Gene Medicine
Department of Molecular Biology and Genetics, Aarhus University

The lecture will be followed by a chalk-board session for PhD students

The Kjeldgaard Lecture Series is organised by
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