



# Karl Friedrich Bonhoeffer Lecture

Thursday, 8<sup>th</sup> September 2011 - 5 pm

Manfred Eigen Lecture Hall,  
Max Planck Institute  
for Biophysical Chemistry

Am Fassberg 11, 37077 Göttingen



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## Signaling within the mammalian circadian timing system

Mammalian behavior and physiology undergo daily rhythms that are coordinated by an endogenous circadian timing system. This system has a hierarchical structure, in that a master pacemaker, residing in the suprachiasmatic nucleus (SCN) of the ventral hypothalamus, synchronizes peripheral oscillators in virtually all body cells. The SCN employs many signaling pathways for the phase-entrainment of peripheral clocks. These include daily feeding-fasting rhythms, cyclic hormones, and body temperature oscillations.

The redundancy of signaling pathways participating in the synchronization of circadian oscillators in peripheral organs render it difficult to assess the importance of an individual pathway in this process. In fact, the elimination of a single pathway has little if any effect on the steady-state phase. However, we have developed approaches allowing us to measure the kinetics of food-induced phase-shifting in liver with a high temporal resolution. These novel imaging technologies have revealed that HSF1 is required for the efficient phase resetting of hepatocyte clocks by feeding. Similar experiments are currently performed to investigate the role of other signaling pathways governed by feeding rhythms, body temperature oscillations, and cyclic blood-borne cues.

Hosts: Gregor Eichele, Henrik Oster