ulm university universität
uulm

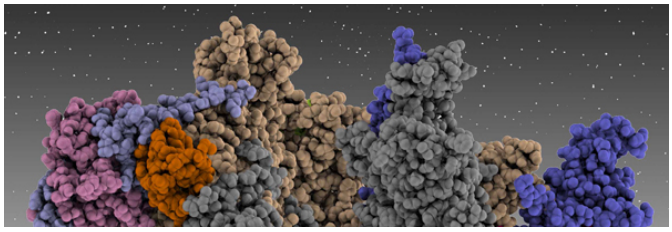
Einladung
zum
Physikalischen Kolloquium

Montag, 06.07.2015
16:15 Uhr in N24/H13

Prof. Dr. Patrick Cramer
Max-Planck-Institut für
biophysikalische Chemie
Göttingen

Principles of genome transcription

Our laboratory studies the molecular mechanisms of eukaryotic gene transcription by RNA polymerase II and the systemic principles of genome-wide transcriptional regulation. We determined structures of RNA polymerase II functional complexes with nucleic acids and protein factors that together with work from other laboratories has led to a first movie of gene transcription (Cheung and Cramer, Cell 2012). The movie outlines both transcription initiation, to a large extent based on our studies of polymerase complexes with TFIIB (Kostrewa et al., Nature 2009; Sainsbury et al., Nature 2012), and transcription elongation, based to a large extent on our studies of polymerase complexes with TFIIS (Kettenberger et al., Cell 2003; Cheung et al., Nature 2010). Recent successes also provide insights into the mechanism of gene regulation during transcription initiation, which requires the central coactivator Mediator. In a long-standing effort, we were able to reconstitute a recombinant, functional 15-subunit core of the Mediator complex and to determine a medium-resolution structure of the RNA polymerase II-Mediator core initiation complex that indicates how Mediator controls transcription (unpublished). We have also developed functional genomics techniques to investigate global transcription in cells. Notable results from this work include the discovery of a cellular mechanism that buffers mRNA levels after perturbation of transcription or RNA degradation (Sun et al., Genome Res. 2012; Sun et al., Mol Cell 2013), the discovery of a novel polymerase modification that controls the transition from transcription elongation to termination (Mayer et al., Science 2012; Schreieck et al., NSMB 2014), the definition of a mechanism for transcriptome surveillance and the repression of pervasive transcription (Schulz et al., Cell 2013) and the detection of pre-mRNA recognition by mRNA biogenesis factors during pre-mRNA splicing and 3'-processing in vivo (Baejen et al., Mol. Cell 2014). In my talk I aim to illustrate how we combine structural biology and functional genomics to help establish the emerging discipline of molecular systems biology.



Ab 15.45 Kaffee, Tee und Kekse vor dem Hörsaal H13

Organisation: **Prof. Dr. F. Jelezko, Tel. 23750**

Host: **Prof. Dr. J. Michaelis, Tel. 23050, off.: 23051**