Karl Friedrich Bonhoeffer Lecture

Thursday, 19th May 2011 - 5 pm

Manfred Eigen Lecture Hall
Max Planck Institute
for Biophysical Chemistry

Am Fassberg 11, 37077 Göttingen

Prof. Dr. Anna Marie Pyle

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Insights into the evolution of RNA metabolism from studies of group II intron structure and function

Group II introns are self-splicing, mobile genetic elements that have fundamentally influenced the organization of terrestrial genomes. These large ribozymes remain important for gene expression in almost all forms of bacteria and eukaryotes and they are believed to share a common ancestry with the eukaryotic spliceosome that is required for processing all nuclear pre-mRNAs. The three-dimensional structure of a group IIC intron was recently determined by X-ray crystallography, making it possible to visualize the active site and the elaborate network of tertiary interactions that stabilize the molecule. It is now possible to examine the molecular features of the active site in detail and to evaluate their correspondence with prior biochemical, genetic, and phylogenetic analyses on group II introns. One can evaluate the structural significance of RNA motifs within the intron core, such as the major-groove triple helix and the domain 5 bulge. Finally, it is interesting to compare features of the group II intron core with known structural features of U6 snRNA in the eukaryotic spliceosome. This analysis leads to a set of predictions for the molecular structure of the spliceosomal active site.

Host: Prof. Dr. Reinhard Lührmann