MPI-NAT SEMINAR SERIES

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Mitochondrial ribosomes structures from plants and Algae, so similar, yet so different…

The vast majority of eukaryotic cells contain mitochondria, essential powerhouses and metabolic hubs. They possess their own gene expression machineries where highly divergent and specialized ribosomes (mitoribosomes) translate the few essential messenger RNAs still encoded by mitochondrial genomes. In plants and algae, the chloroplast ribosomes strongly resemble those of bacteria, while the mitoribosomes have diverged significantly during evolution and present strikingly different structures across these photosynthetic species, and across eukaryotes more generally. In spite of common physiological features in photosynthetic organisms, we show that their mitoribosomes present tremendous structural and functional differences. In green plants, mitoribosomes have unusually expanded ribosomal RNAs and a dozen plant-specific proteins that belong to the family of pentatricopeptide repeats (PPR), in addition to the common conserved mitoribosomal proteins. Whereas in green algae, like *Chlamydomonas reinhardtii*, the mitoribosomal RNA appears rather minimalistic and uniquely made of 13 rRNA fragments encoded by separate non-contiguous gene pieces, stitched together through several additional proteins, mainly OPR, PPR and mTERF helical repeat proteins. In this presentation, we will describe these plant and algae - specific mitoribosomal features and discuss their implications on the regulation of the mitochondrial mRNA translation process.

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Host: Marina Rodnina & Niels Fischer

Manfred Eigen Hall

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