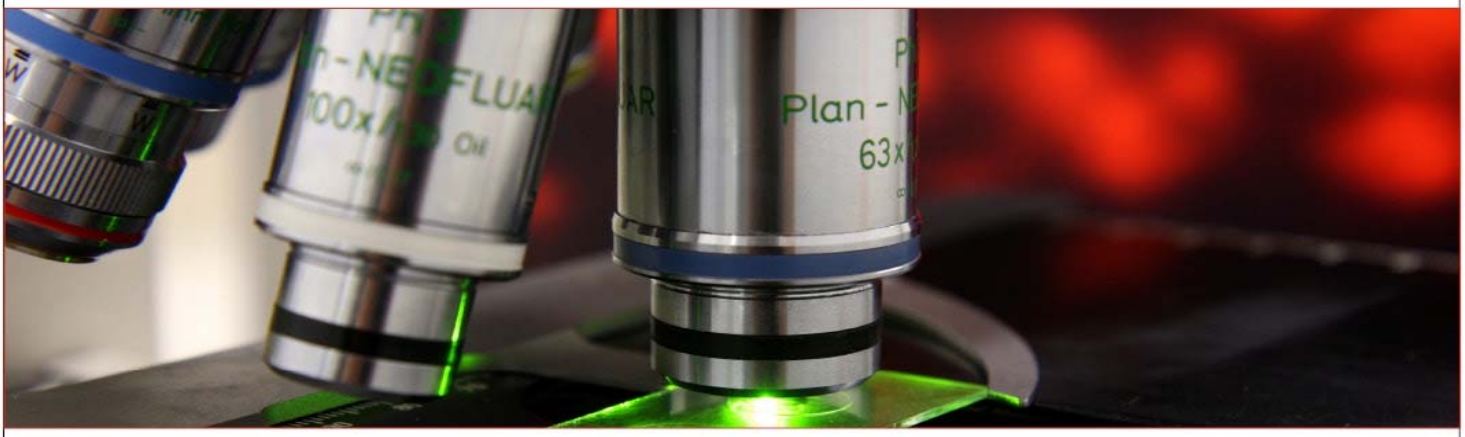
SÉMINAIRES ET CONFÉRENCES



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« Seeing ribosomes assemble: structural and biochemical studies of early eukaryotic ribosome assembly»

Ribosomes are assembled in a remarkably complex process. Eukaryotic cells require some 200 non-ribosomal factors which coordinate the folding, modification and cleavage of the ribosome RNA, the incorporation of ribosomal proteins and the quality control necessary to lead rise to the small and large ribosomal subunits. Ribosome assembly begins in the nucleolus where RNA polymerase I transcribes the large 35S pre-rRNA, which is immediately bound by several ribosome assembly factors, leading to the formation of a large ribonuclear particle named the small subunit (SSU) processome, which represents the earliest assembly intermediate of the small ribosomal subunit. Despite a wealth of genetic and proteomics data, little was known about the assembly mechanism and structure of the SSU processome, thereby limiting our understanding of the roles of early ribosome assembly factors. By using cryo-electron microscopy, we have determined the structure of the SSU processome to a resolution of 3.8A. Our structure reveals how more than 50 ribosome assembly factors coordinate the pre-18S rRNA to prevent the formation of premature folding states. Combined with biochemical data on the assembly of the SSU processome, these results provide a new model on the early steps in eukaryotic ribosome assembly.

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