

Department seminar



日時：8月22日（火曜日）、16:00-17:00

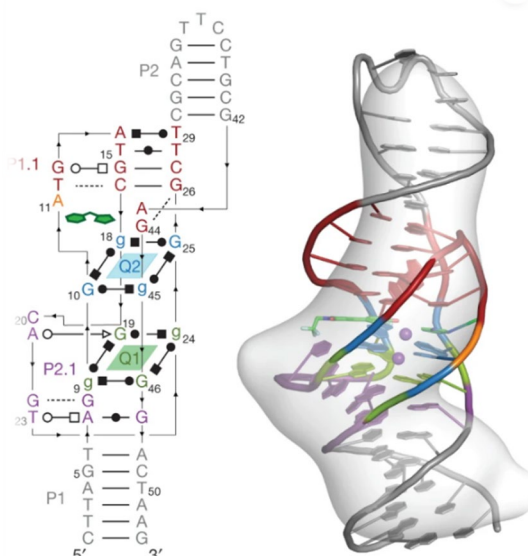
場所：工学部1号館15号講義室

演者：Adrian R. Ferré-D'Amaré

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DNA doing what you expect RNA to do: from aptamers to stress granules

70 years after the discovery of the B-DNA structure by Crick, Franklin and Watson, the question remains whether DNA can adopt complex structures and carry out functions other than storing genetic information. I will discuss two recent discoveries from my group. First, we determined the crystal structure of a fluorogenic aptamer DNA, and found that it adopts a complex structure, more compact than many RNAs of similar size (50 nt), without using strategies employed by RNA. Thus, in principle, new structural principles of nucleic acid structure may be forthcoming from the study of functional DNAs. Second, we have recently purified stress granules and analyzed their composition. It has long been assumed that these eukaryotic cytoplasmic membraneless organelles, essential for cellular survival of stressors, contain mRNA and proteins. We discovered that in addition, stress granules contain extrachromosomal circular cytoplasmic DNA (eccDNA). Through CRISPR treatment, we demonstrate that these circular double-stranded DNAs are necessary for stress granule formation in live cells. Sequence analysis implies the presence of sequence-complementarity (e.g., R-loops) between the mRNA and DNA components of stress granules, suggesting an architectural role for organelle formation for cytoplasmic circular DNA, from yeast to mammals.



このセミナーに関する連絡先

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