KEMIJSKI INŠTITUT

Vabilo na Preglov kolokvij / Invitation to the Pregl colloquium

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Velika predavalnica Kemijskega inštituta /
Great Lecture Hall
National Institute of Chemistry
Hajdrihova 19, Ljubljana, Slovenia

From the Ends of Telomeres to the Start of Life: Investigations of Nucleic Acid Quadruplexes and Hexaplexes

The RNA World Hypothesis posits that RNA was originally responsible for both information storage and chemical catalysis. In 1999 we proposed that the fact that the four nucleotide bases of RNA do not form Watson-Crick base pairs in water as free monomers presents a major problem for the prebiotic synthesis of RNA, and therefore a different ancestral RNA-like molecule (or proto-RNA) may have come first. The observation that mononucleotides of guanine (the G in RNA and DNA) assemble into supramolecular structures in water with G-tetrad structures inspired me to study G-quadruplex DNA with the goal of understanding what allows for small, heterocyclic molecules to form ordered assemblies in water. My laboratory has now identified a set of plausible prebiotic nucleobases that satisfy multiple criteria for the earliest bases of proto-RNA. Moreover, when attached to a peptide backbone these bases create very stable hexaplexes, which provides a compelling model for the structure of proto-RNA.

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Vljudno vabljeni / Kindly invited