

Initiating Molecular Life

Initiative: "Leben?" - Ein neuer Blick der Naturwissenschaften auf die grundlegenden Prinzipien des Lebens

(beendet)

Bewilligung: 09.07.2019

Laufzeit: 5 Jahre

Projekt-Website: <https://www.cup.lmu.de/oc/trapp/>

The origin of life has begun with prebiotic molecules reacting in not yet completely identified pathways to produce important intermediates and key molecules. The transition from the synthesis of small molecules and biopolymers to a biosynthetic machinery is completely unknown. The central question of this project is what level of complexity is required to trigger evolution at the molecular level of small organic molecules? The aim is to identify organocatalysts that can be formed under prebiotic conditions and modify themselves or their own building blocks catalytically step by step in order to achieve improved selectivity and reactivity. In particular, thiazolidines and other five-membered heterocycles with (photo-)organocatalytic properties will be synthesized under prebiotic conditions and investigated. Of central importance for such a photoorganocatalytic system are day and night cycles, which moves the system out of equilibrium and represent a simple photochemical system. Detailed kinetic and mechanistic investigations will allow creating the basis for a chemical reaction network and making predictions about evolution on a molecular level leading to life.

Projektbeteiligte

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Open Access-Publikationen

Investigation of Straightforward, Photoinduced Alkylations of Electron-Rich Heterocompounds with Electron-Deficient Alkyl Bromides in the Sole Presence of 2,6-Lutidine

Dynamic Exchange of Substituents in a Prebiotic Organocatalyst: Initial Steps towards an Evolutionary System

Selective Phosphorylation of RNA- and DNA-Nucleosides under Prebiotically Plausible Conditions

Synthesis of prebiotic organics from CO₂ by catalysis with meteoritic and volcanic particles

First Steps Towards Molecular Evolution (Prebiotic Chemistry and the Origin of Life)

