



Physical Organic Chemistry

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Understanding Catalysis and the Origin of Life

The overarching goal of our research is to develop methods capable of predicting and rationalizing the outcome and mechanism of organic reactions in aqueous solutions. To achieve this, we combine experimental studies of reaction kinetics and thermodynamics with high-throughput experimentation and methods from computational chemistry and data science.

Our central research interest is to establish a quantitative approach to understanding the *organic chemistry and mechanisms of catalysis involved in the emergence of life*. We are investigating methods that can achieve predictions of the dominating pathways of complex mixtures of substrates. Additionally, we are using a combination of experimental and theoretical approaches to establish a mechanistic understanding of central reactions of prebiotic chemistry and investigate the dynamics and molecular mechanisms of complex catalytic reaction networks.

