



UNIVERSITÄT GREIFSWALD
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Das **Institut für Biochemie** lädt gemeinsam mit dem Ortsverband der
Gesellschaft Deutscher Chemiker zu einem

K o l l o q u i u m d e r G D C h

Großer Hörsaal des Instituts für Biochemie
Felix-Hausdorff-Str. 4, Greifswald

Montag, 23. Juni 2025, 16 Uhr c.t.

Prof. Dr. Dieter Braun

AG Braun, Physics, LMU, Geschwister-Scholl-Platz 1, D-80539 Munich

spricht zum Thema:

Steps towards a simplified RNA world

Abstract:

Understanding the origin of life on Earth is a deep mystery. But it can be solved with scientific methods and detailed laboratory experiments. We report on attempts to recreate molecular evolution in the laboratory under the conditions of the early Earth. They mimic the geophysical nonequilibria on a volcanic island and combine them with an early biochemistry that could form and replicate RNA sequences.

The environments we study include wet-dry cycles, isothermal airflow and systems driven by temperature differences, both with an air-water interface [1] and without [2]. In addition to using proteins to accelerate evolutionary dynamics, we are attempting to initiate early evolution from activated 2',3'-cyclic nucleotides in the alkaline environment of volcanic rock. By focusing on the polymerisation of RNA, its copying by templated ligation [3], we have found evidence for early molecular cooperation between RNA and amino acids. The non-equilibrium settings can create vesicles, accumulate transcription-translation systems and trigger the evolution of protein-enhanced ligation reactions [1]. Our goal is to find geochemical environments that bridge the early evolution of RNA to the formation of the first cells.

[1] Ianeselli et.al., *Nature Physics* doi.org/10.1038/s41567-022-01516-z (2022)

[2] Matreux et.al., *Nature* doi.org/10.1038/s41586-024-07193-7 (2024)

[3] Serrão et.al., *JACS* doi.org/10.1021/jacs.3c10813 (2024)

Einladende

Prof. Dr. Sabine Müller

Dr. Christian Fischer

Vorsitzender des Ortsverbandes der GDCh