

# New Catalyst Makes Olefin Metathesis Accessible to Biology

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**Newswise** — A new ruthenium catalyst could help expand olefin metathesis for applications in biology. Researchers from the Swiss Nanoscience Institute network have developed a water-compatible system that can be selectively attached to different biomolecules. Their findings were recently published in the scientific journal *Angewandte Chemie International Edition*.

Olefin metathesis is one of the most important reactions in organic chemistry for forming carbon–carbon bonds – for example, in the production of pharmaceuticals, plastics, and complex natural products. However, previous ruthenium catalysts that enable this reaction have faced a major challenge: they rapidly degrade in aqueous or biological environments, making their use in natural systems such as cells or blood extremely challenging.

A team of researchers from the Swiss Nanoscience Institute and the Department of Chemistry at the University of Basel has now developed a new approach: they have prepared a new ruthenium catalyst featuring a specifically tailored ligand, a cyclic (alkyl) (amino) carbene (CAAC). “The new catalyst is not only significantly more stable in water, but can also be selectively attached to biomolecules,” explains Damian Graf, first author of the publication and a doctoral student at the SNI PhD School.

Thanks to an integrated aniline group, the catalyst can be coupled to proteins or peptides. This not only allows it to remain active for longer – with up to 600 reaction cycles – but also enables its targeted use in biological systems.

This advance paves the way for applications in which chemical reactions could take place directly in living organisms without harming them. Olefin metathesis is therefore moving one step closer to becoming a useful tool in chemical biology and medicine.

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