

Molecular machines besides motion

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Can we exploit the operation principles of molecular machines for purposes different from motion?

Since molecular motors can perform work thanks to ratchet mechanisms, mastering these operating principles may enable energy-demanding (endergonic) processes, that seemingly overcome thermodynamic barriers.^[1,2]

As a young principal investigator, in this *Intro Talk* I will present how my research background^[3,4] is evolving into future directions. The overarching goal of my group's research is contributing to unravel how energy sources can drive non-equilibrium processes at the molecular level.



Epitomic example. Suitably engineered monomers (middle) can spontaneously assemble into ordered low-energy structures (left). This process is reasonably well controlled by chemists. On the other hand, exploiting an energy source to induce the assembly of an energy-demanding structure (right) is far from trivial. The talk will illustrate how the principles at the basis of molecular motion can be exploited to obtain high-energy assemblies and drive other non-equilibrium processes.

References:

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