



Exploiting Bistable Architectures to Create Dynamic Networks with Emergent Properties

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The development of molecular bistable architectures has attracted considerable attention over the last decade, not only due to the fundamental interest in understanding and controlling structure-property relationships, but also for the exploration of synthetic life-like materials. Such systems have proven to be particularly useful in applications such as catalysis, biomedicine as well as materials science. This presentation will outline recent developments on the exploration of two bistable architectures – switchable hydrazones¹ (**Figure 1a**) and fluxional barbaralanes² (**Figure 1b**) – to construct novel dynamic networks with useful emergent properties. Coupling chemically-activated hydrazone switches in the solution state results in a competition for resources which establishes a strict operational hierarchy that leads to an emergent systems response.³ On the other hand, functionalised barbaralane systems show controllable and adaptable sp^3 -carbon stereochemistry, allowing for the transmission of stereochemical information which can be exploited within enantioselective synthesis.⁴

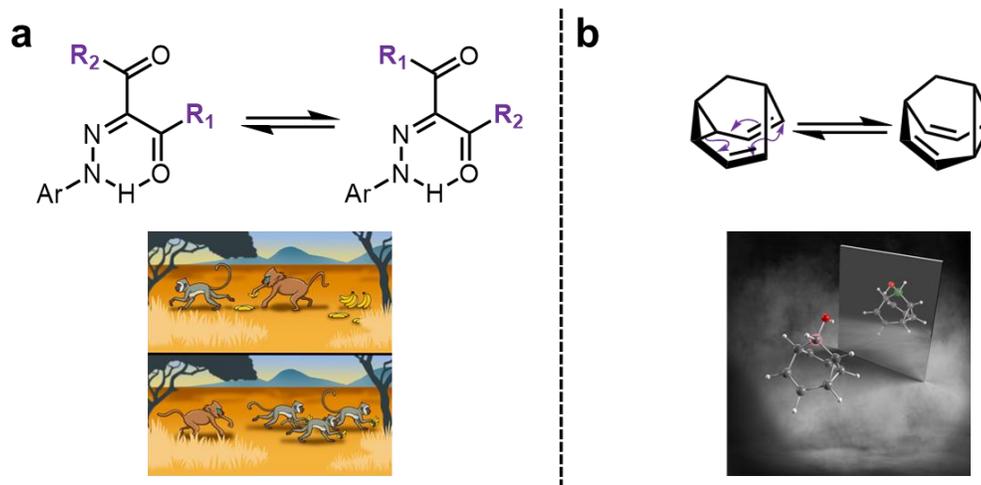


Figure 1. Coupling hydrazone switches leads to interspecific competition (a) whereas fluxional barbaralanes show adaptable sp^3 -carbon stereochemistry (b).

References

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