New Tools and Uses of Dynamic Covalent Chemistry

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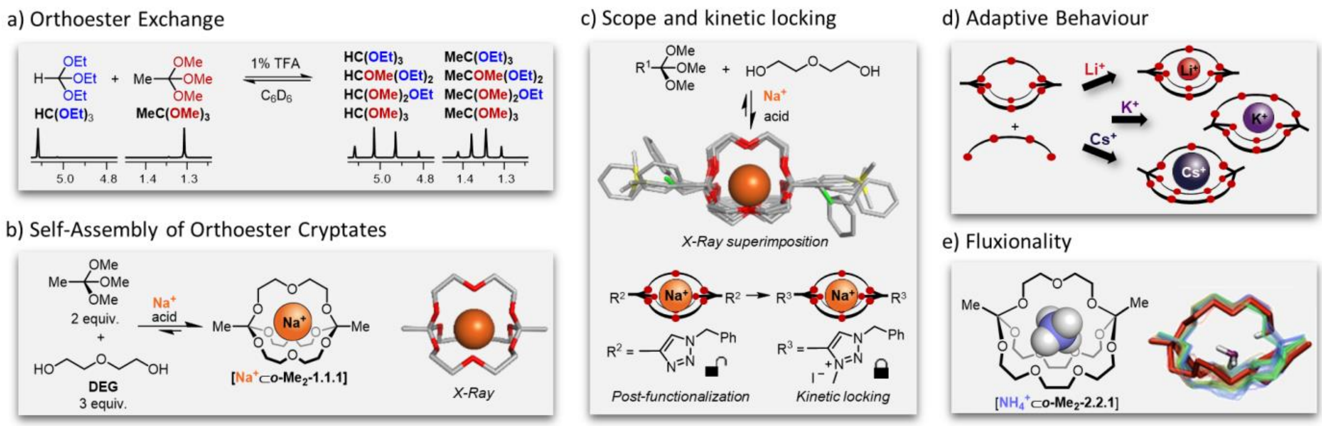
Dynamic covalent chemistry (DCC) is a powerful tool for probing non-covalent interactions, identifying ligands for medicinally relevant biological targets, and for making use of the feature of "error correction" to achieve the synthesis of interesting molecules and materials.[1]

In this talk, I will present our recent work on a previously ignored dynamic covalent reaction: the acid-catalyzed reaction of *O*,*O*,*O*-orthoesters with alcohols (Fig. a),[2a] which we were able to use for the one-pot synthesis of cryptates, in which orthoesters act as tripodal bridgeheads.[2b] Due to their unique structure (Fig. b), these compounds exhibit a range of unusual properties, including tunable, pH-dependent hydrolysis (Fig. c).[2c] Most notably, dynamic orthoester architectures offer an elegant entry to experiments, in which a metal ion selects its preferred host from a dynamic mixture of competing subcomponents ("adaptive host-guest systems", Fig. d).[2d] Of particular relevance to the area of systems chemistry is our recent discovery that ammonium complexes of orthoester cryptands represent the first example of "fluxional supermolecules", i.e. these host-guest complexes are inherently dynamic and adaptive (Fig. e).[2e]

I will close the talk by discussing unpublished work on "new" dynamic covalent reactions and their (potential) uses.



References:

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