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## IT'S TIME TO SEPARATE


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## Ring Around The Catalyst

Switchable rotaxane masks organocatalyst in one position and exposes it in another

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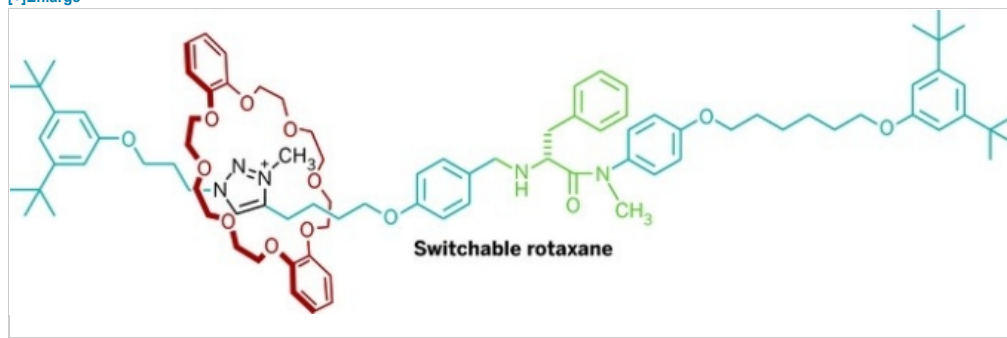
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An asymmetric catalyst that can be switched on via deprotonation and switched off by simply adding acid has been developed by chemists at the University of Manchester, in England. The system, created by [David A. Leigh](#) and coworkers, features a chiral acyclic secondary amine (shown, green) as an asymmetric organocatalyst housed within a rotaxane (*J. Am. Chem. Soc.* 2014, DOI: [10.1021/ja501561c](#)). Rotaxanes are mechanically interlocked molecules in which a macrocycle is threaded onto a dumbbell-shaped compound. In Leigh's rotaxane system, the center of the dumbbell contains both the organocatalyst and a triazolium ring (black). When the organocatalyst is protonated, a crown ether macrocycle (red) encircles it, preventing it from participating in a chemical reaction. Deprotonating the molecule prompts the macrocycle to move to the triazolium ring and exposes the catalyst. Leigh's team found that when the catalyst is exposed, it can participate in an asymmetric Michael addition. "Simultaneously employing different types of artificial switchable asymmetric catalysts may enable different products to be prepared from common pools of achiral building blocks, simply by switching the different catalysts on and off," the chemists note.

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