

## Radical cascade cyclisations for complexity generation

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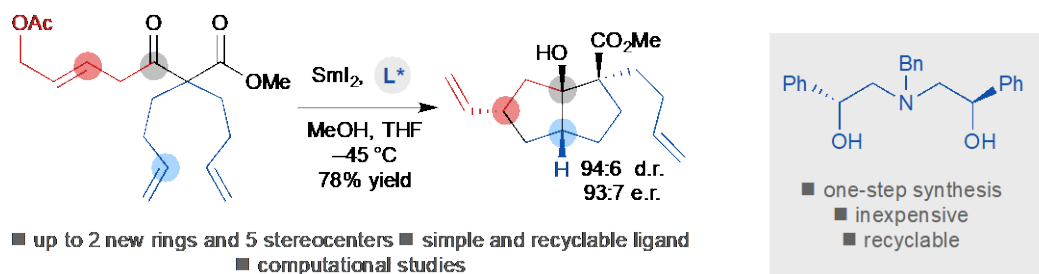
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Samarium(II) iodide ( $\text{SmI}_2$ ) is a reductive, single electron transfer (SET) reagent, that is used widely in synthetic chemistry.<sup>[1,2]</sup> We have discovered how to use the reagent to generate highly unusual ketyl radical anions by SET to esters and amides and we have used the resultant radicals in new cyclizations and cyclization cascades.<sup>[3]</sup> The first part of the lecture will describe recent work on ester-alkene<sup>[4]</sup> and amide-alkene<sup>[5]</sup> radical cyclizations and the development of *folding cascades* that allow complex polycyclic 3D products to be assembled rapidly with high control.<sup>[6]</sup>

While the ability of  $\text{SmI}_2$  to generate ketyl radical anions from aldehydes and ketones is well-established,<sup>[1,2]</sup> up to now, attempts to render subsequent radical couplings enantioselective through the action of a chiral ligand have met with little success. The second part of the lecture will describe the development of the first chiral ligand-controlled, enantioselective cyclizations and cyclization cascades mediated by  $\text{SmI}_2$ .<sup>[7]</sup>



## References

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- [4] For recent examples, see: (a) Just-Baringo, X.; Clark, J.; Gutmann, M. J.; Procter, D. J. *Angew. Chem. Int. Ed.* **2016**, *55*, 12499. (b) Morrill, C.; Jensen, C.; Just-Baringo, X.; Grogan, G.; Turner, N.; Procter, D. J. *Angew. Chem. Int. Ed.* **2018**, *57*, 3692.
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