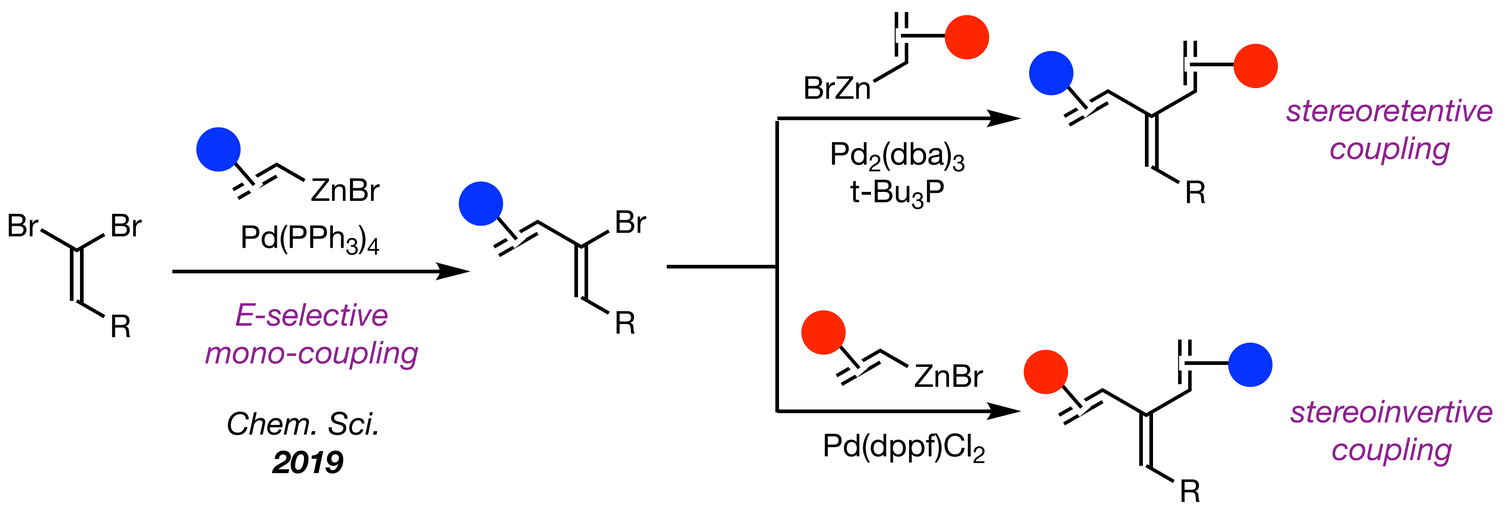
Sherburn Group Research

Recent Highlights

Australian National University

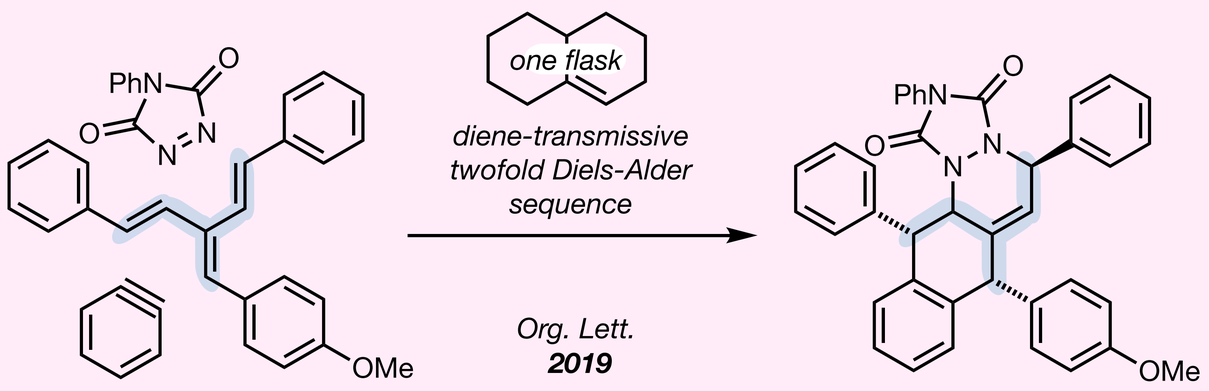
Development of Efficient New Synthetic Methods



Chem. Sci. ***2019***

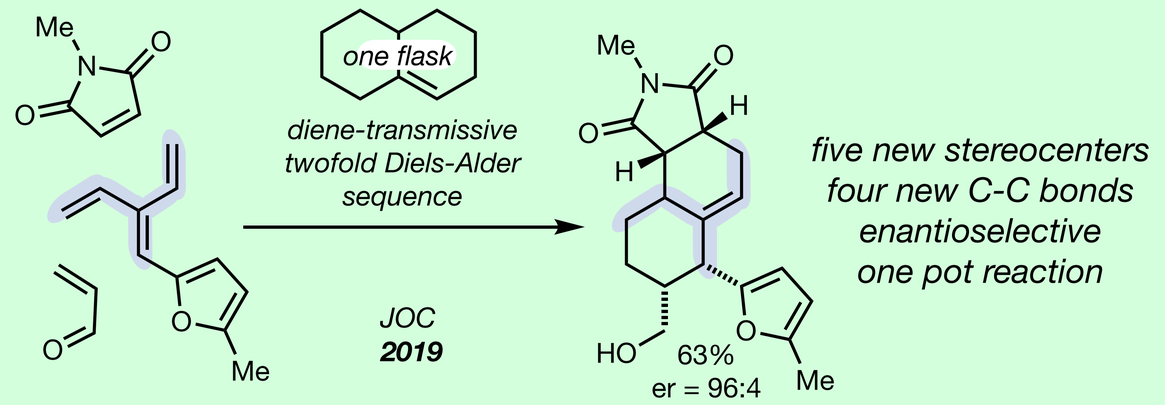
- *over 50 substituted [3]dendralenes synthesised!*
- *can access stereoisomers of dendralenes for the first time*
- *compounds used in further chemistry to rapidly generate complexity*

Substituted dendralenes undergo Diels-Alder reactions with benzynes!



Org. Lett. ***2019***

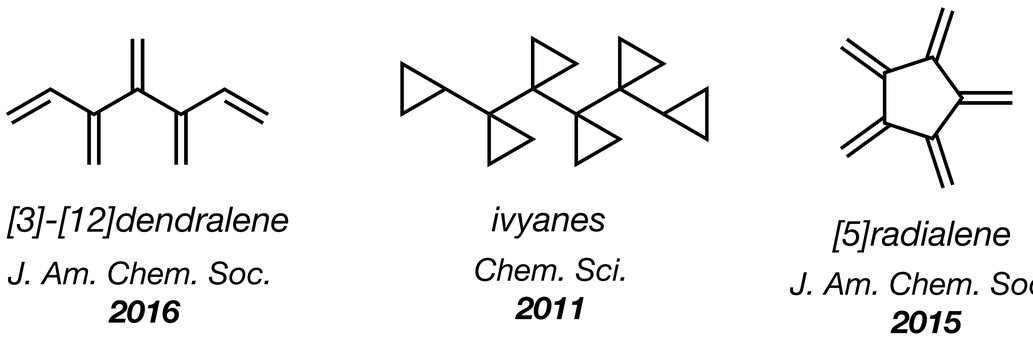
Substituted dendralenes can be used in organo-catalysed enantioselective Diels-Alder Reactions



JOC ***2019***

five new stereocenters
four new C-C bonds
enantioselective
one pot reaction

Fundamental Molecule Target Synthesis

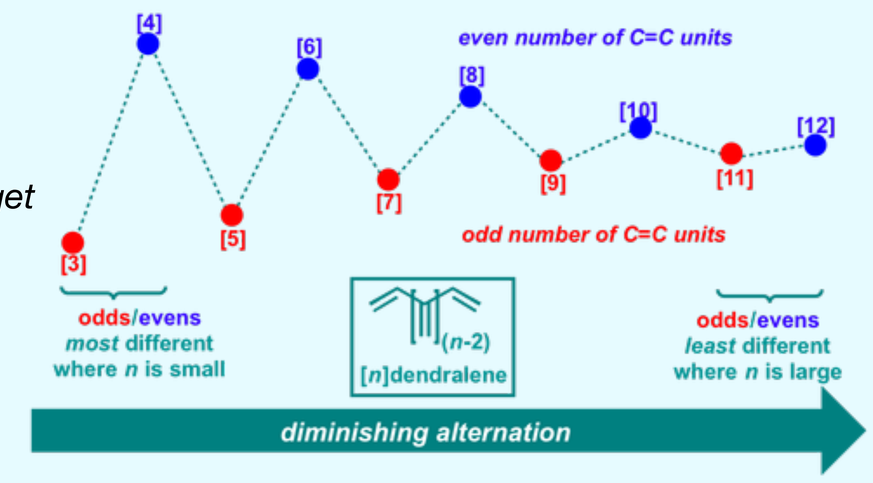


[3]-[12]dendralene
J. Am. Chem. Soc. ***2016***

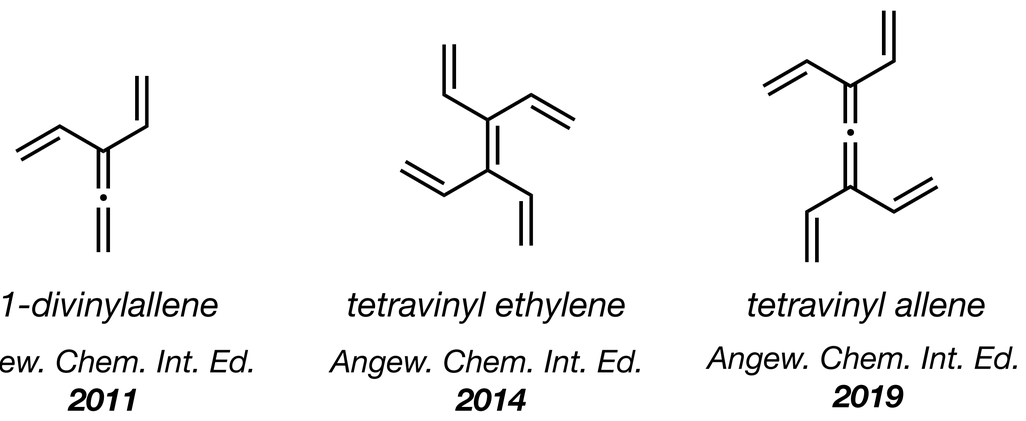
ivyanes
Chem. Sci. ***2011***

[5]radialene
J. Am. Chem. Soc. ***2015***

We investigate the properties associated with these fundamental target molecules and often find interesting patterns in behaviour, like with the dendralene family!



'Cannot be made'



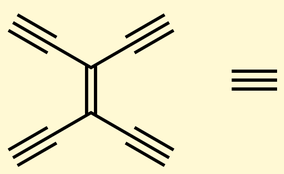
1,1-divinylallene
Angew. Chem. Int. Ed. ***2011***

tetravinyl ethylene
Angew. Chem. Int. Ed. ***2014***

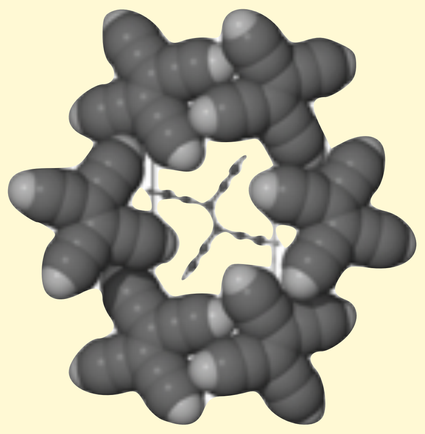
tetravinyl allene
Angew. Chem. Int. Ed. ***2019***

Our group likes to show that compounds like these can be made and are often stable under standard laboratory conditions! This opens up many new possibilities.

We boldly go where no chemist has gone before!



tetraethynyl ethylene



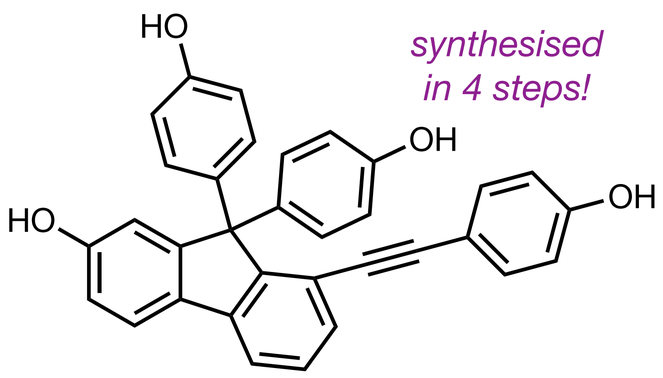
first X-Ray!!!

two step synthesis

highly unstable!

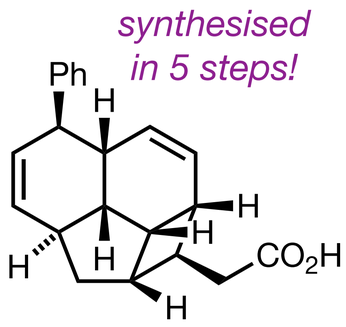
compound decomposes in air at ambient temperature in a matter of minutes

Efficient Total Synthesis of Natural Products



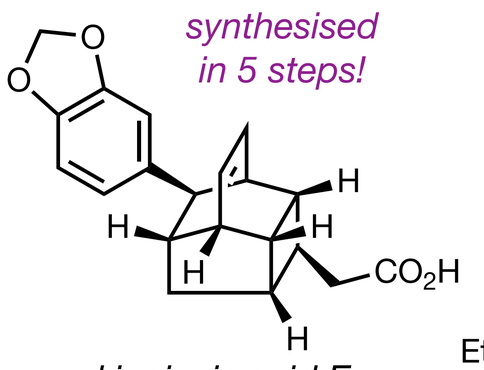
synthesised in 4 steps!

selaginpulvilin D
Org. Lett. ***2017***



synthesised in 5 steps!

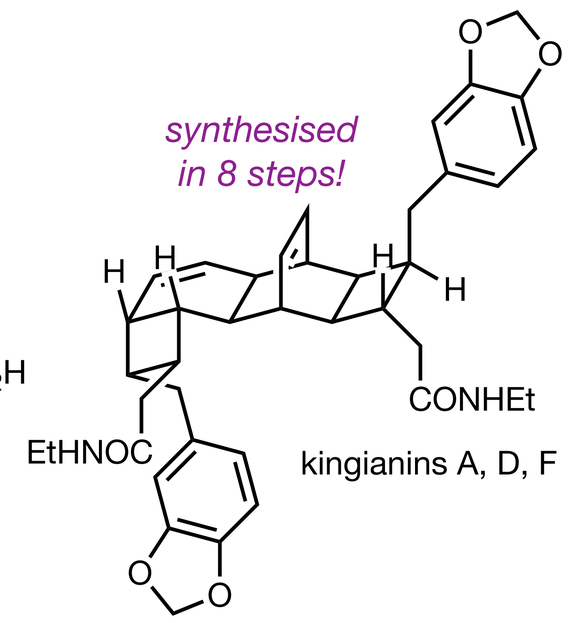
endiandric acid A



synthesised in 5 steps!

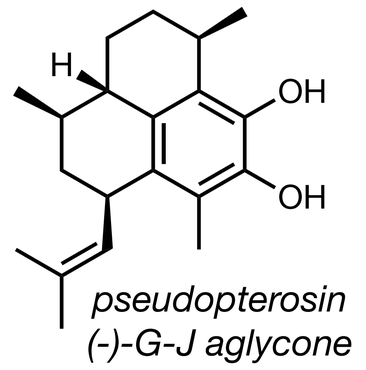
kingianic acid E

Chem. Sci. ***2015***



synthesised in 8 steps!

kingianins A, D, F



synthesised in 11 steps!

pseudopterosin (-)-G-J aglycone

Nat. Chem. ***2015***

We have published the shortest, most efficient total syntheses to date of all of these natural products!

Want to know more? Check out our website: sherburngroup.org, follow us on Twitter @sherburn_lab or email Mick: Michael.Sherburn@anu.edu.au