

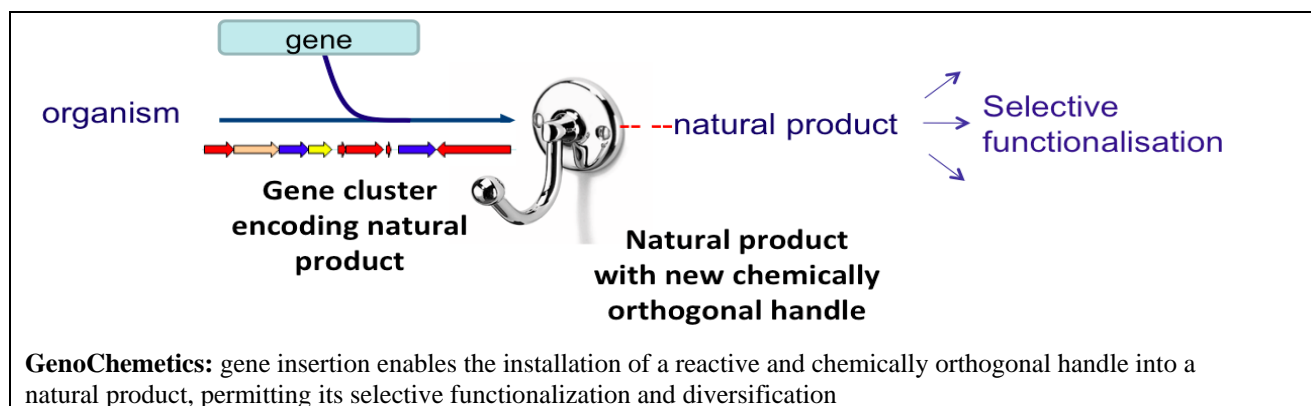
GenoChemetic Diversification of Natural Products

(Blending SynBio+ SynChem : The Best of Both Worlds)

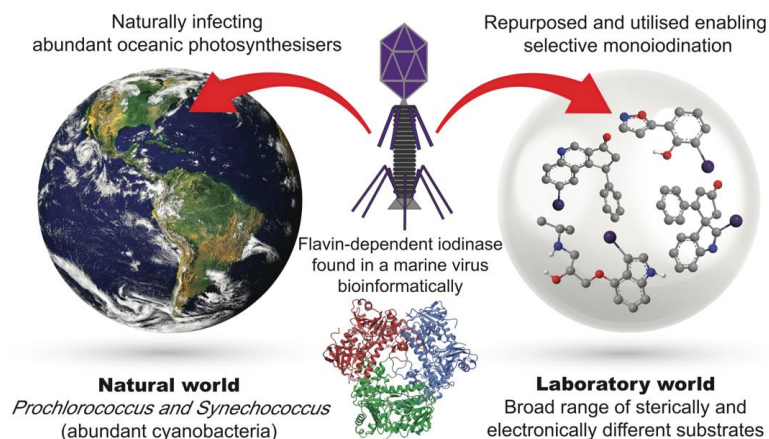
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Though natural products represent a treasure trove of medicinally relevant compounds, they are commonly misperceived to be unsuitable for medicinal chemistry. We are developing new approaches to natural product analogue synthesis by blending together synthetic biology and synthetic chemistry. By complementing the biosynthetic machinery encoding an existing natural product with foreign genes we are able to introduce chemically orthogonal, reactive and selectable functionalisable handles into natural products.¹ We have been developing mild chemical methodologies to enable the chemical derivatization of these handles.^{2,3}



Here we report new enzymatic tools for late stage halogenation of molecules including a viral encoded iodinease,⁴ and mild and even cell compatible cross-coupling methodologies for use in GenoChemetic approaches

1. Living GenoChemetics: Hyphenating Synthetic Biology and Synthetic Chemistry *in vivo*, Sunil V. Sharma, Emma J. Rackham, Enrico Morelli, Refaat Hamed, & Rebecca J. M. Goss* *Nature Communications*, **2017**, 8, 229 doi:10.1038/s41467-017-00194-3
2. Heck diversification of indole based substrates under aqueous conditions: from indoles to unprotected halo-tryptophans and halo-tryptophans in a natural and a new to nature natural product. Cristina Pubill-Ulldemolins, Sunil V. Sharma, and Rebecca J. M. Goss* *Chem. Eur. J.* **2019** <https://doi.org/10.1002/chem.201901327>
3. Fully aqueous and air compatible cross coupling of primary alkyl halides, Samuel Molyneux, and Rebecca J. M. Goss* *ACS Catalysis*, **2023** <https://doi.org/10.1021/acscatal.3c00252>
4. A Marine Viral Halogenase, that Iodinates Diverse Substrates, DS Gkotsi and Rebecca J. M. Goss* *Nature Chemistry*, **2019**, 11, 1091-1097 <https://rdcu.be/bUkja>.