Exploiting HTE for novel methodology development

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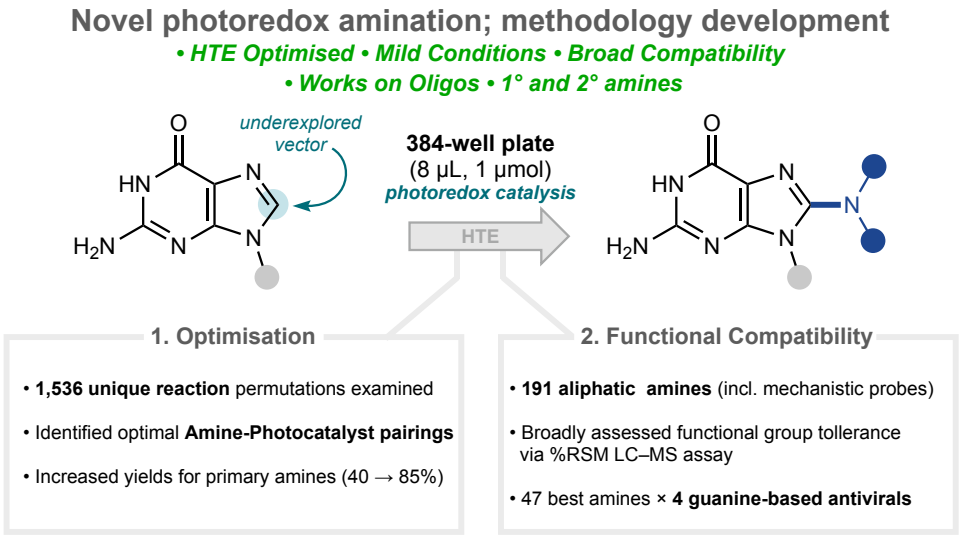
We have established a plate-based high-throughput experimentation platform[1] in the Gaunt lab that is capable of screening thousands of nanoscale reactions per week. Adapting this workflow to various reaction manifolds such as C–H activation, photoredox, and bioorthogonal chemistry has enabled us to accelerate the development of novel methodology significantly. Herein will be presented the development of our high-throughput photoredox capabilities and its application towards the accelerated development of a novel bioconjugation strategy for oligonucleotides, based on previous group work.[2] Our implementation of HTE included a reaction optimisation screen of 1,536 reactions (requiring only 1.5 mmol of starting material) in addition to a microscale scope that yielded 379 unique compounds – some which were able to serve as mechanistic probes.



[1] Santanilla, A. B.; Regalado, E. L.; Pereira, T.; Shevlin, M.; Bateman, K.; Campeau, L. C.; Schneeweis, J.; Berritt, S.; Shi, Z. C.; Nantermet, P.; Liu, Y.; Helmy, R.; Welch, C. J.; Vachal, P.; Davies, I. W.; Cernak, T.; Dreher, S. D. *Science,* **2015**, *347* (6217), 49–53.

[2] Nappi, M.; Hofer, A.; Balasubramanian, S.; Gaunt, M. J. *J. Am. Chem. Soc.* **2020**, *142* (51), 21484–21492.