

## BIOMIMETIC HALOGENATIONS AT UNACTIVATED C-H BONDS

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Aliphatic carbon-chlorine bonds are among the most versatile manifolds in synthetic chemistry. They are widely and routinely employed in a vast array of reactions ranging from the traditional nucleophilic substitutions, eliminations or in the formation of Grignard reagents to the more recent and sophisticated transition metal-catalysed cross coupling reactions<sup>1,2</sup>. Facile and sustainable methods that allows for the direct formation of C-Cl bonds starting from abundant and inexpensive unactivated C-H bond containing molecules are still missing. Despite the highly toxicity of Cl<sub>2</sub> and the poor regioselectivity, the radical chlorination of unactivated C-H bonds is still the most widely use procedure at industrial scale.

If synthetic chlorination of unactivated C-H bonds are hard to carry out, enzymatic halogenation occurs much more smoothly at room temperature, ambient pressure using oxygen as oxidant and chlorine ions as source of halide.<sup>3</sup> A biomimetic approach to access alkyl halides in a facile and sustainable manner has been previously employed.<sup>4,5,6</sup> However, the yield and selectivity are poor and the halogenating reactions often competes with the oxygenating one.<sup>4,5,6</sup>

A novel method, bioinspired to the family of non-haem halogenases, which allows for the functionalisation of unactivated C-H bonds has been developed in the lab. Yield and selectivity are superior than those reported in the literature and no side oxygenating reaction has been detected.

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