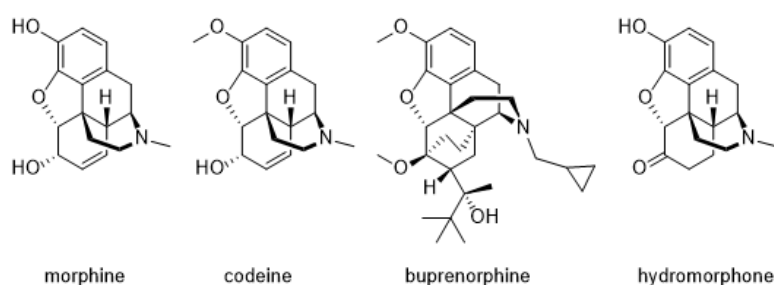


# CATALYSTS DERIVED FROM SUSTAINABLE NATURAL AND VALUE ADDED ALKALOIDS FROM POPPIES

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Alkaloids are a group of naturally occurring compounds that contain nitrogen heterocycles. Morphine and similar alkaloids are classified based on the 'morphinan' skeleton. The morphine alkaloids (Fig. 1) (e.g. morphine, codeine, buprenorphine, hydromorphone) are well studied in medicinal chemistry [1] but their use in asymmetric organocatalysis is a new research area. The rigid and well-defined morphine scaffold can be a source of chiral information for stereoinduction in asymmetric catalysis. A major advantage of morphine is that it is abundant, renewable and cheap raw material.



*Figure 1 Morphine alkaloids*

In this work, morphine alkaloids can be easily modified into quaternary ammonium salts which then can be used as phase transfer catalysts. The initial studies show that quaternary ammonium salt of codeine can act as a phase transfer catalyst and the catalysed reaction yields a product with modest ee%.

The authors acknowledge funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement #621364 (TUTIC-Green).

## References

1. Pathan, H.; Williams, J., 2012, *British Journal of Pain*, 6, 11-16.

