

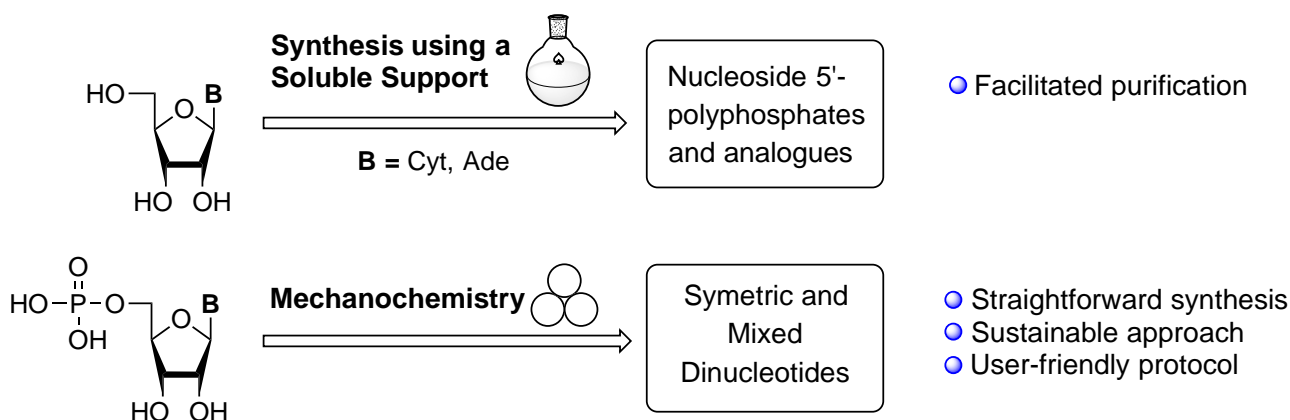
## Alternative synthetic approaches for nucleotides and derivatives

Béatrice Roy

*Nucleosides & Phosphorylated Effectors Team, Institute for Biomolecules Max Mousseron (IBMM), UMR 5247 CNRS, University of Montpellier, ENSCM, Campus Triolet, cc 1705, Place Eugène Bataillon, 34095 Montpellier, France  
e-mail: beatrice.roy@umontpellier.fr*

The lively interest in nucleotides, derivatives and analogues used as mechanistic probes to investigate enzymes or versatile chemical tools for assay development to therapies and diagnostics has prompted the development of improved synthetic routes to access these compounds.[1,2] Moreover, their isolation still presents a major challenge, due to the fastidious purification procedures required, associated with the derivatives' relatively low chemical stability.

In recent years, we have focused our attention on alternative approaches, that simplifies purification and/or improves sustainability. On one hand, we have developed solution procedures using soluble supports such as poly(ethylene glycol) or a benzene-centred tripodal support to prepare cytosine and adenosine nucleotides, respectively.[3] On the other hand, we used mechanochemistry, an emerging technique that enables solid/solid reactions through mechanical grinding under solventless or solvent-free conditions, to prepare dinucleotides.[4]



Scheme 1. New synthetic strategies to prepare nucleotides and derivatives.

### References

- [1] For reviews : a) B. Roy, A. Depaix, C. Périgaud, S. Peyrottes, *Chem. Rev.*, **2016**, *116*, 7854–7897; b) D. R. W. Hodgson, *Adv. Phys. Org. Chem.*, **2017**, *51*, 187–219.
- [2] a) J. Y. Liao, S. Bala, A. K. Ngor, E. J. Yik, J. C. Chaput, *J. Am. Chem. Soc.*, **2019**, *141*, 13286–13289; b) D. Bezold, T. Durr, J. Singh, H. J. Jessen, *Chem. – Eur. J.* **2020**, *26*, 2298–2308.
- [3] a) A. Depaix, J.-Y. Puy, B. Roy, S. Peyrottes, *New J. Chem.* **2018**, *42*, 16441–16445; L. Appy, S. Peyrottes, B. Roy, *Eur. J. Org. Chem.*, accepted manuscript.
- [4] L. Appy, A. Depaix, X. Bantreil, F. Lamaty, S. Peyrottes, B. Roy, *Chem.–Eur. J.* **2019**, *25*, 2477–2481.