

# MAKING COMPOUNDS INSPIRED BY NATURE - FROM TARGETED TO DIVERSITY-ORIENTED SYNTHESSES

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Natural products are the usual targets of total synthesis, often involving big challenges to achieve the construction of molecular complexity. Not only does it provide access to hardly accessible compounds for in-depth biological studies, but it also contributes to the development of new synthesis methods targeting singular structural patterns. In short, total synthesis makes it possible to *prepare* compounds of interest.<sup>1</sup> Our goal is to achieve total synthesis and search for biological application perspectives.<sup>2</sup> Our methodologies include those allowing the rapid generation of complexity and of diversity: bio-inspired strategies, late functionalization in a medicinal context, pericyclic or cascade reaction. Applications in medicinal chemistry, chemobiology, or agronomy have been found. This presentation will show some of our most recent achievements in natural products total synthesis, including oxepine derivatives (janoxepine, radulanine A),<sup>2a</sup> cytochalasins (periconiasins, aspochalasins),<sup>2b-d</sup> and in the diversity-oriented synthesis of nature-inspired quinolones,<sup>2e,f</sup> and their applications in biology.

## References:

[1] Chemical Synthesis: Gnosis to Prognosis, C. Chatgililoglu and V. Snieckus (eds.), 1996, Kluwer Academic Publishers, pp. 223-243 [retranscription du workshop de Ravello, Italy, 1994, par C. H. Heathcock: *As we head into the 21st century, is there still value in total synthesis of natural products as a research endeavour?*]

[2] For recent achievements, see: (a) W. Zhang, E. Baudouin, M. Cordier, G. Frison and B. Nay, *Chem. Eur. J.* **2019**, *25*, 8643-8648; (b) M. Zaghouani, O. Gayraud, V. Jactel, S. Prévost, A. Dezaire, M. Sabbah, A. Escargueil, T.-L. Lai, C. Le Clainche, N. Rocques, S. Romero, A. Gautreau, F. Blanchard, G. Frison, B. Nay, *Chem. Eur. J.* **2018**, *24*, 16686-16691; (c) O. Gayraud, B. Laroche, N. Casaretto, B. Nay, *Org. Lett.* **2021**, *23*, 5755–5760; (d) M. Zaghouani, C. Kunz, L. Guédon, F. Blanchard, B. Nay, *Chem. Eur. J.* **2016**, *22*, 15257–15260; (e) X.-W. Li, J. Herrmann, Y. Zang, P. Grellier, S. Prado, R. Müller, B. Nay, *Beilstein J. Org. Chem.* **2013**, *9*, 1551-1558; (f) Q. Ronzon, W. Zhang, N. Casaretto, E. Mouray, I. Florent, B. Nay, *Chem. Eur. J.* **2021**, *27*, 7764-7772.