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Editorial

Catalyzed Synthesis of Natural Products

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Natural Products are secondary metabolites, that have been the inspiration for chemists and chemical biologists for many years and have a special relevance in the chemical space [1]. From ancient times, they have held the interest of the population due to their applications in life. Natural products can be isolated from both terrestrial or marine plants, animals, and microorganisms. Until two centuries ago, when morphine was isolated, the use of natural products was through employing extracts of plants or animals. The isolation of this natural product changed the way these compounds and their properties were observed by the scientific community. In the recent two hundred years, there has been an enormous development of their isolation, structural determination, and synthesis. The interest in the synthesis of these compounds is not only for confirming structure by spectroscopic methods but also to obtain intermediates and analogues in order to conduct structure–activity relationship (SAR) studies and increase the biological activity of the natural product itself. In the last years, several synthetic strategies have appeared such as diversity-oriented synthesis (DOS) [2], biological-oriented synthesis (BiOS) [3], and function-oriented synthesis (FOS) [4], in order to access to complex and functional diverse molecules that fill the chemical space. [5] In this manner, synthesis has evolved towards a simpler and ecological way to obtain natural products [6,7], using biotransformation [8], combinatorial chemistry [9], or catalysts [10] that improve the synthesis by diminishing the use of metals and, since 2000, also making use of organocatalysts [11].

In this issue, some of these methodologies have been recompiled in order to have an idea of the best methods for the synthesis of natural products by catalysis.

In this manner, Prof. Chojnacka, using immobilized lipases as catalyst, has obtained structured phosphatidylcholine enriched with myristic acid. [12] Profs. Vila and Pedro made use of enantioselective catalysts derived from (*S*)-mandelic acid for studying the catalytic enantioselective addition of dimethylzinc to isatins [13]. An extra step is the use of organocatalysts, in this manner, Prof. Diez shows the possibility of the obtention, in a diastereoselective manner, of the 7,8-carvone epoxides using organocatalysts as proline, quinidine, and diphenylprolinol [14]. Another methodology for the synthesis of natural products in a cheap, simple, clean and scalable method is the use of deep eutectic mixtures as reaction media. Profs. Alonso and Guillena tell us about the use of this methodology for the enantioselective organocatalyzed α-amination of 1,3-dicarbonyl compounds [15]. As has been said, not only synthesis but biotransformation has been one of the methodologies for more efficient synthesis of natural products. In this respect, Prof. Wu illustrates us with the biotransformation of ergostane triterpenoid antcin K by *Psychrobacillus* sp. Ak 187 [16]. Finally, Prof. Kovayashi reviews the total synthesis and biological evaluation of phaeosphaerides, where the use of catalysts can be appreciated for not only obtaining natural products but, also, their analogues for SAR studies and increasing the biological activity of synthesized compounds [17].

In this manner, the reader, through this issue, could gain an idea of the new directions that the synthesis of natural products using catalysts will have in the years to come.

Conflicts of Interest: The authors declare no conflict of interest.

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