

# Synthesis of Flavonoids or Other Nature-Inspired Small Molecules

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Natural compounds are endowed with an intriguing variety of scaffolds, functional groups and stereochemical properties. Natural evolution continuously gives rise to extremely complicated arrangements of polysubstituted rings and chiral centers. In addition to the interest that such molecules trigger from the point of view of synthetic organic chemistry per se, the world of natural compounds has been explored by medicinal chemists considering the valuable biological activities that they bear, inspiring the design and development of novel drugs.

The Special Issue of *Molbank*, entitled “Synthesis of Flavonoids or Other Nature-Inspired Small Molecules”, was launched in Spring 2020, and collected 10 contributions by the end of 2021 with a wide geographical reach. The Guest Editor is grateful to all the authors that actively contributed to the Special Issue by submitting the results of their research activity in the field of the synthesis of natural and nature-inspired compounds.

Among small molecules of natural origin, flavonoids represent an outstanding chemical class. Together with their semi-synthetic derivatives, flavonoids have been extensively studied in light of their antioxidant, antiproliferative, antibacterial and anti-inflammatory activities, to name a few. Therefore, this Special Issue aimed to collect contributions related to the following topics:

- Chemistry of flavonoids, alkaloids and natural compounds;
- Semi-synthetic compounds;
- Heterocycles;
- Stereochemistry;
- Analytical chemistry and structure elucidation.

In fact, in addition to flavonoids, several other classes of natural or nature-inspired molecules, such as alkaloids and terpenoids, are particularly attractive from the synthetic and medicinal chemistry perspectives.

In the first paper, the preparation and characterization of a semi-synthetic hydrazone derivative of quercetin, studied as a phosphodiesterase inhibitor and synthesized through the single-step modification of the natural precursor, was reported by our research group from the University of Brescia (Italy) [1]. In the second paper, Prof. Unang Supratman and colleagues from Universitas Padjadjaran (Indonesia) described a polyoxygenated dimer-type xanthone isolated from the stem bark of *Garcinia porrecta* [2]. In the third paper, a new onoceranoid triterpene was isolated from the fruit peels of *Lansium domesticum* by Dr. Tri Mayanti and colleagues from Universitas Padjadjaran (Indonesia), and the compound was tested for its antiproliferative activity [3]. In the fourth paper, Dr. Mariia Nesterkina and colleagues from Odessa National Polytechnic University (Ukraine), described the synthesis of 2-propyl-*N'*-[1,7,7-trimethylbicyclo[2.2.1]hept-2-ylidene]pentanehydrazide, a camphor derivative with anticonvulsant properties [4]. In the fifth paper, the synthesis and characterization of a quinoline derivative were described by the group of Dr. Paolo Coghi and Prof. Vincent Kam Wai Wong from the Macau University of Science and Technology (China). Furthermore, the compound was tested for its antiproliferative activity against several cell lines [5]. In the sixth paper, the novel tetranortriterpenoid kokosanolide D was isolated from *Lansium domesticum* by Dr. Tri Mayanti and colleagues from Universitas



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Padjadjaran (Indonesia), and the compound was characterized through a combination of spectroscopic techniques [6]. In the seventh paper, Dr. Mithun Rudrapal and colleagues from the Dhariwal Institute of Pharmaceutical Education & Research (India) described flavonoids from *Cordia dichotoma* and their antidiabetic activity, based on computational and experimental data [7]. In the eighth paper, a novel curcumin analogue developed as a potential fluorescent dye for biological systems was synthesized and characterized by Prof. Marco Edilson Freire de Lima and colleagues from Universidade Federal Rural do Rio de Janeiro (Portugal) [8]. In the ninth paper, Dr. Diana Becerra, Dr. Juan-Carlos Castillo and colleagues from Universidad Pedagógica y Tecnológica de Colombia and Universidad de los Andes (Colombia) reported the synthesis of 2-oxo-2H-chromen-7-yl 4-chlorobenzoate obtained by O-acylation of 7-hydroxy-2H-chromen-2-one [9]. Eventually, in the tenth paper, lupeol extracted from *Bombax ceiba* was used by Dr. Thuc-Huy Duong from the Ho Chi Minh City University of Education (Vietnam), Dr. Jirapast Sichaem from Thammasat University (Thailand), and colleagues, as a starting material to produce semi-synthetic derivatives exhibiting  $\alpha$ -glucosidase inhibitory activity [10].

All these interesting contributions demonstrate the flourishing interest of the international scientific community in the identification and optimization of novel synthetic routes for producing nature-inspired bioactive compounds. As a conclusive note, the Guest Editor would like to sincerely thank the Reviewers and the Assistant Editors for their valuable support and for having made the realization of this Special Issue possible.

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