Tentative Outline

**TITLE of the thematic issue:** The Pentacyclic Triterpenoids

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**Aims & Scope:**

Inflammation is a defense reaction of the body, and a local response of living tissues to injury in mammalians aimed at eliminating or limiting the spread of an injurious agent. The use of medicinal plants or their active components is becoming an increasingly attractive approach for treating various inflammatory disorders. The origin of the anti-inflammatory properties of various phytomedicines can be explained by the presence of substances such as flavonoids, alkaloids, tannins, saponins, anthraquinones, triterpenoids, and other constituents which act as inhibitors of molecular targets and proinflammatory mediators in inflammatory responses. Attempts will be made to cover almost all the anti-inflammatory agents which fall under the various chemical structural classes of compounds showing required activity.

Triterpenoids are constituents that have aroused great interest in recent years due to their significant pharmacological potential, with numerous therapeutic activities, such as anti-inflammatory, antiviral, hepatoprotective, giardicidal, and acetylcholinesterase inhibitors.

Biotransformation is the biological process of modifying an organic compound into a reversible product. Microbial transformation can make feasible reactions that are not likely to be carried out by traditional synthetic procedures. Recent enzymatic biotransformation studies on sesquiterpenes have resulted in the isolation of novel anti-inflammatory compounds. Clinical pharmacology and therapeutic potential of triterpenoid and its derivatives in the treatment of diseases is well known, such as ursolic acid. The spectrum of biological activities that have been attributed to ursolic acid and its derivatives have made them pharmaceutically interesting because of its multi-target properties. It has limited active sites for chemical modification, it’s not easy to obtain large number of its derivatives for effective structure activity relationship study. Thus, microbial transformation is often the only rational way to obtain the desired metabolites from bioactive compounds. Sesquiterpene lactones that is being tested in clinical trials as an anti-cancer agent. Similarly betulin itself has no pronounced biological activities but provide access to betulinic acid. All attempts to chemically oxidize betulin to betulinic acid have failed so far. Therefore research experiments shifted toward biooxidtation of betulin.

Artemisinin and its derivatives are renowned for their potent anti-inflammatory activity. Artemisinin is available only for oral and rectal administration. Absorption is incomplete and elimination is fast, with and elimination half-life of 2 to 5 hours. Plasma concentrations after a single 500 mg oral dose most often exceed 200 micrograms/L. Artesunate and artemether can be considered as prodrugs. Among artemisinin repertoire of beneficial properties are its high efficacy, fast action, and reduce likelihood for resistance. The applicability of artemisinin as drug is, nevertheless, limited by its low solubility and poor oral bioavailability. To develop even more effective drug candidates than artemisinin, chemical hybridization and microbial biotransformation of artemisinin has been used recently to produce promising derivatives of artemisinin on a large scale with low costs.
With the concerted efforts in the novel synthesis of sesquiterpene analogs and clinical pharmacology of sesquiterpene, it is likely that sesquiterpene lactones drugs will become a major armamentarium combating a variety of human diseases.

Over the last decade, chemically modified polymers have been extensively investigated for their use in the field of drug delivery system. In particular polymers exhibiting permeation enhancing and efflux pump inhibitory properties have been developed. These polymers have gained much interest for drug delivery system due to their capability to improve bioavailability of formulated drugs.

To demonstrate the latest achievement of nanotechnology and its application, for drug delivery such as targeted drug delivery system, nanostructure for drug storage, nanomaterials for tissue engineering, medical diagnosis and treatment, and generation of new kinds of materials from biological sources, the synthesis methods, basic techniques of micro-/nanoscale fabrication, that have enabled reproducible production of nanostructures, medical applications of various nanostructures and nanodevices in clinical diagnostics and detection of important biological molecules, the prospects, benefits, and limitations of using these novel nanostructures in the fields of biodetection and medical diagnostics will be incumbent discussion.

After oral administration in rodents, triptolide, a diterpenoid triepoxide compound, active as anti-inflammatory, immunosuppressive, and anticancer agent, is rapidly absorbed into the blood circulation followed by a short elimination half-life. Such significant and rapid fluctuations of triptolide in plasma likely contribute to its toxicity, which is characterized by injury to hepatic, renal, digestive, reproductive, and hematological systems. Various drugs have been incorporated in polymers displaying p-glycoprotein inhibition and permeation enhancing capability in order to improve their oral bioavailability.

**Keywords:** Inflammation, Biotransformation, Triterpenoids, Anti-inflammatory compounds, Artemisinin.

**Subtopics:** The subtopics to be covered within this issue are listed below:

1- Clinically useful artemisinin as drug with multiple targets in anti-inflammatory and more treatment: focus on artemisinin derivatives
2- Characterization of pharmaceutical nanocarriers and processes nanostructures for oral medicine drug delivery system
3- Enzymatic biotransformation of clinically useful anti-inflammatory, anti-tumor, anti-malarial, anti-viral, anti-bacterial, anti-fungal sesquiterpenes as bioactive drug
4- Sources and the methods of HPLC coupled with different detectors for the analysis of pentacyclic triterpenoids in medicinal plants.
5- Bioavailability of anti-inflammatory triterpenoids
6- Pharmacology and therapeutic potential of triterpenoids and its derivatives Clinical studies of triterpenoids
7- Biotransformation a promising technology for anti-inflammatory drug development

**Schedule:**
Manuscript submission deadline: 31st August 2019
Peer Review Due: 15th September 2019
Revision Due: 15th October 2019
Announcement of acceptance by the Guest Editors: 30th October 2019
Final manuscript due: 15th November 2019