

Tentative Outline

Special Thematic Issue for Current Organic Chemistry

Title of thematic issue: Green Chemistry: Opportunity in Drug Discovery Research

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Aims & Scope:

In last few decades, the synthetic approaches towards the development of different varieties of compounds of medicinal and material interest have taken a paradigm shift. In contrast to the conventional approaches in organic synthesis where achieving the best product yield of a target compound was the prime focus without paying much attention towards the impact of the synthetic methodology adopted for it, on the Safety, Health and Environment (SHE), the development of environmentally benign and green synthetic reaction protocols and technology is the principal goal in the present scenario. In that direction, the development of the concept of green chemistry and its twelve basic principles by Prof. Paul T. Anastas and John C. Warner, works as a guiding tool for the synthetic chemist. The prevention or minimization of waste generation, increasing % atom economy, decreasing environmental factors (*E* Factor), catalysis, efficient use of energy etc. are some of the key points of the basic principles. In the present thematic issue titled "Green Chemistry: Opportunity in Drug Discovery Research", the development of synthetic methodologies which are in accordance with the principles of green chemistry towards achieving different types of organic transformations will be covered. In particular, the application of the green and eco-friendly reaction protocols for synthesis of pharmacologically important organic scaffolds will be highlighted in the present thematic issue.

Keywords:

Green synthesis, Drug Development, Chemotherapeutic agents, Ionic liquids, Microwave, Ultrasonication, Visible-Light Induced Organic Synthesis, Solvent-free organic synthesis, Reaction in aqueous media, Enzymatic Synthesis, Mutasynthesis, Metal-Free synthesis, Carbocycles, Heterocycles, Carbohydrates, Glycosylation, Pot-economic Approach, Multi-Component synthesis, Heterogeneous Catalysis, Organophosphorus reagent, Alternative to toxic reagents, Photopharmacology, Drug development, Lead optimization, Photolysis, Environment benign C-H activation and C-C and C-heteroatom bond formation methodology.

Subtopics along with Contributing Authors and Abstract

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

- ✓ Editorial, Green Chemistry: Background, Impact and Opportunities in Drug Development.
- ✓ Ionic Liquid As Green Alternative Towards Synthesis of Medicinally Relevant Scaffolds.
- ✓ Visible-Light Induced Organic Synthesis towards biologically relevant organic scaffolds and Photopharmacology.
- ✓ Exploiting Microwave- assisted Organic synthesis for an easy access of Bioactive scaffolds.
- ✓ Solvent-Free Synthesis of Pharmaceutically Important Biological Scaffolds And Drugs.
- ✓ Metal-Free Approach Towards Arylation of Therapeutically Relevant Organic Scaffolds (Carbocycles/Heterocycles).
- ✓ Synthesis of Biologically Relevant Molecules inside Nano-reactors under environmental Benign conditions
- ✓ Ultrasound Induced Synthesis of Biologically Active Organic Scaffolds.
- ✓ Metal-Encapsulated Organic Frameworks as Heterogeneous Catalyst In Organic Synthesis
- ✓ Heterogeneous catalysis in organic synthesis for Medicinally Important Scaffolds.
- ✓ Pot-Economic Approach/Multi-Component Approach towards Access to Biologically Relevant molecules.
- ✓ Adopting Biocatalysis (enzymatic) towards synthesis of medicinally important molecules and also the Complex Glycans and Bridged Nucleic Acids of Great Chemotherapeutic Values.
- ✓ Organic synthesis avoiding protection/de-protection and One-pot Glycosylations.
- ✓ Mutasynthesis of medicinally significant natural products through manipulation of gene governing starter unit.
- ✓ Alternative to toxic chemicals in Organic synthesis.
- ✓ Green Approach towards C-C and C-X (N, O, P etc.) Bond Forming Reactions.

List of confirmed/tentative contributors with the title:

Title no. 1: Green Chemistry Approaches to Asymmetric Addition Reactions: Great Impact in future drug discovery program

- **Authors names:** Prof. Girija Shankar Singh
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- **Abstract:** TBA
- **Keywords:** Asymmetric synthesis; Addition Reactions, Chiral Induction, Aldol Reactions, C-C bond formation, Green synthesis, Drug development.

Title no. 2: Application of Natural Chiral Pool in Environmentally Sustainable Organic Synthesis of Biologically Relevant Molecules.

- **Authors names:** Prof. Ghanashyam Bez
- **Affiliation:** Department of Chemistry, North-Eastern Hill University (NEHU), Shillong, Meghalaya-793022.
- **Email:** bez@nehu.ac.in
- **Abstract:** TBA
- **Keywords:** Asymmetric synthesis, Chiral pool, Green synthesis, Drug Development, Environment benign, Enzymes in organic synthesis.

Title no. 3: Recent Advance on Photoredox-Catalyzed Functionalization of Aryldiazonium Salts

- **Authors names:** Prof. Guobing Yan
- **Affiliation:** Department of Chemistry, Lishui University, Lishui 323000, Zhejiang Province, P. R. China.
- **Email:** gbyan@lsu.edu.cn
- **Abstract:** TBA
- **Keywords:** Photocatalysis, Coupling, C-C and C-X bond formation, Aryldiazonium salts ion.

Title no. 4: Ultrasound Induced Synthesis of Biologically Active Organic Scaffolds.

- **Authors names:** Prof. Goutam Brahmachari
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- **Email:** goutam.brahmachari@visva-bharati.ac.in
- **Abstract:** TBA
- **Keywords:** Green chemistry, Heterocycles, Drugs, Ultrasound, Environmental Benign synthesis.

Title no. 5: Exploiting Microwave (MW)-assisted Organic Synthesis for Accessing Bioactive scaffolds.

- **Authors names:** Prof. Ram Sagar
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- **Email:** ram.sagar@bhu.ac.in
- **Abstract:** TBA
- **Keywords:** Microwave, Green chemistry, Heterocycles, Drugs, Environmental Benign condition

Title no. 6: Synthesis of Medicinally Relevant Scaffolds in Green Solvent Ionic Liquids.

- **Authors names:** Prof. Diganta Sarma
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- **Abstract:** TBA
- **Keywords:** Ionic Liquids, Triazole, Heterocycles, Drug Development, Green chemistry.

Title no. 7: One-Pot Glycosylation Strategy for Rapid Access of Oligosaccharides with Wide Range of Molecular Diversity

- **Authors names:** Dr. Pintu K Mondal
- **Affiliation:** Medicinal Chemistry and Process division, CSIR-Central Drug Research Institute- Lucknow, India.
- **Email:** pk.mandal@cdri.res.in
- **Abstract:** TBA
- **Keywords:** One-pot protections, Glycosylation, Environmental Benign glycosylation, Molecular diversity, Drug Development.

Title no. 8: Recent Advances in the Synthesis of Biologically Relevant Bridged Nucleic Acids.

Authors names: Dr. Priyanka Mangla¹, Dr. Balaji Olety^{2*}, Dr. Vivek K. Sharma

- **Affiliation:** ²Department of Molecular Cell and Cancer Biology, University of Massachusetts Medical School, Worcester, MA, USA.
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- **Abstract:** TBA
- **Keywords:** Nucleic Acids, Glycohybrids, Enzymatic synthesis, Anti-viral Drug

Title no. 9: Mutasynthesis of Medicinally Significant Natural Products Through Manipulation of Gene Governing Starter Unit.

- **Authors names:** Prof. Debraj Mukherjee
- **Affiliation:** Natural Product Chemistry Division, CSIR-Indian Institute of Integrative Medicine, Jammu-80001, India.
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- **Abstract:** TBA
- **Keywords:** Mutasythesis, Natural Products, Gene, Green chemistry, Carbohydrates.

Title no. 10: Enzymatic Synthesis of Complex Carbohydrate-containing Molecules of Chemotherapeutic Values.

- **Authors names:** Prof. Honzchi Cao
- **Affiliation:** National Glycoengineering Research Cente, Shandong University, Jinan, China.
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- **Abstract:** TBA
- **Keywords:** Green Chemistry, Enzyme, Regioselectivity, Stereoselective Synthesis, Glycans.

Title no. 11: Synthesis of Pharmaceutically Important Scaffolds under Solvent-Free Conditions

- **Authors names:** Prof. Amitabh Jha, Dr Prabhu P Mohapatra
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- **Abstract:** TBA
- **Keywords:** Green Synthesis, Drug development, Solvent-free condition, Inclusion complex.

Title no. 12: Multi-component Reactions for biologically Relevant Heterocycles and Drugs Under Environment Benign Conditions

- **Authors names:** Prof. Ramendra Pratap
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- **Abstract:** TBA
- **Keywords:** Multi-component Reactions, Heterocycles, Drug, Environment Benign Condition, One-pot synthesis, Drug Development.

Title no. 13: Diverse Synthesis of Organic Molecules Inside the Nano-reactor in Aqueous Media under mild conditions

- **Authors names:** Prof. Dilip K. Maiti
- **Affiliation:** FRSC, Department of Chemistry, University of Calcutta, 92 A.P.C. Road, Kolkata-700009.
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- **Abstract:** TBA
- **Keywords:** Environment Benign condition, Nano reactor, Reaction in aqueous media, Drug Development.

Title no. 14: Photopharmacology: An ideal strategy for an easy access of Pharmacologically Potent Molecules under Photolysis conditions.

- **Authors names:** Dr Shiva K. Rastogi
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- **Abstract:** TBA
- **Keywords:** Photopharmacology, Drug development, Lead optimization, Photolysis, Green chemistry, environmental benign condition

Title no. 15: Oxidation of Polysaccharides for control of their Biodegradability.

- **Authors names:** Prof. Kazuaki Matsumura
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- **Abstract:** TBA
- **Keywords:** Polysaccharides, Biodegradability, Cryobiology, Green chemistry, Drug development, Biomaterials.

Title no. 16: Alternatives to Carbon Tetrachloride for Radical Halogenation Reactions

- **Authors names:** Prof. Vito Ferro
- **Affiliation:** School of Chemistry, The University of Queensland, Queensland, Australia.
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- **Abstract:** TBA
- **Keywords:** Radical Halogenation Reactions, Carbon Tetrachloride, Green synthesis.

Title no. 17: Recent Advances in the Catalytic Addition of Carboxylic Acids to Alkynes and Propargylic Alcohols

- **Authors names:** Prof. Victorio Cadierno
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- **Abstract:** TBA
- **Keywords:** Green chemistry, Propargylic alcohols, Alkynes, Carboxylic acids, Catalysis.

Title no. 18: Recent Developments in the MW-assisted Synthesis of Organophosphorus compounds

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- **Abstract:** TBA
- **Keywords:** Green chemistry, Organophosphorus reagent, Microwave, Catalysis.

Title no. 19 Heterogeneous catalyses in organic synthesis for Medicinally Important scaffolds

- **Authors names:** Prof. Bela Torok
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- **Keywords:** Green chemistry, Drug development, Catalysis, Heterogeneous catalysis.

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