Recent Advancement against Neglected Diseases

Neglected Diseases are those that affect almost exclusively poor and powerless people living in rural parts of low-income countries [1]. They sometimes attract other labels, such as tropical diseases or poverty-related diseases. Neglected diseases include leishmaniasis (kalazar), onchocerciasis, Chagas disease, leprosy, tuberculosis, schistosomiasis, lymphatic filariasis, African trypanosomiasis (sleeping sickness), malaria and dengue [2]. Some are life-threatening, while others result in high morbidity and severe disabilities [1, 3].

Currently some of these tropical infections have become a major global concern, due to serious sequelae; as Zika Virus and Ebola. Also, geographical distances between continents do not represent a barrier to infectious agents due to rapid transport. Infected human hosts can travel facilitating epidemics.

The objective for this thematic issue was to report recent studies about different approaches in drug discovery, which comprises synthesis, semi-synthesis, the search for new targets, natural products, evaluation of biological activities, and/or theoretical approaches as structure-based approaches, SAR, QSAR, docking and several cheminformatics methods [2], for investigation and selection of new lead molecules. These efforts involve several studies to aid the drug discovery of new options for the treatment of neglected diseases.

Dengue like any neglected tropical disease affects a large part of the world population. In this disease, the infection is caused by arboviruses transmitted by A. aegypti and A. albopictus mosquito, in which the most severe manifestation is known as dengue hemorrhagic fever. The infected person presents symptoms characteristic of fever and rash. Among the ways of fighting dengue by bioactives is the inhibition of NS2B-NS3 protease, inhibition of protein E, and inhibition of sclerotization of the vector cuticle. The cuticle is indispensable for the survival of the mosquito that can be compromised through the inhibition of arylalkylamine N-acetyltransferase (aaNAT). In our manuscript entitled Dengue Virus Inhibition Targets: A Review and Docking Study, in silico tests were performed as molecular docking, functional density analysis, molecular orbitals energies and of the interactions between the bioactive and the targets studied were analyzed. However, in addition to discussing the fight against dengue virus infection through different routes, some in silico results of 27 analogs of myricetin have been presented, which showed action on the cuticle sclerotization mechanism.

Dengue Fever: A Worldwide Threat: An Overview of the Infection Process, Environmental Factors for Global Outbreak, Diagnostic Platforms, and Vaccine Developments by Hosseini et al, is a review article also focused on Dengue. The paper covers essential topics including an overview on neglected tropical diseases with specific emphasis on Dengue fever, mosquito's cycle of life and mechanism of infection, adaptive response, and different stages in Dengue immunopathogenesis. The current work is also dedicated to the thorough study of Dengue outbreak across the globe with a brief study of tropical and subtropical regions. Moreover, this review article demonstrates the correlation between the climatic factors and Dengue incidence.

In the manuscript entitled, Discovery of Potent Inhibitors for the Inhibition of Dengue Envelope Protein: An In Silico Approach, Aarthi & Singh showed a study with the crystal structure of Dengue Envelope protein from the protein data bank optimized through Schrodinger. The structure based virtual screening based on the co-crystallised ligand has been carried out with the small molecule libraries and based on the docking score, interaction and energy values, best complexes were selected. The selected complexes were further taken forward for the conformational stability analysis through Molecular dynamics simulation. From the results it is evident that the compounds DB00179, Quercetin, Silymarin, Dapagliflozin and Fisetin could be novel and potent candidates to inhibit the DENV envelope protein.

Many of the tropical diseases are neglected by the researchers and medicinal companies due to lack of profit and other interests. The Drugs for Neglected Diseases Initiative (DNDi) was established to overcome the problems associated with these neglected diseases. According to a report published by the WHO, leprosy (Hansen's disease) is also a neglected infectious disease. The treatment used until now for leprosy is multi-drug treatment. The complete genome identification of Mycobacterium leprae makes the research easy to develop target specified drugs for leprosy. Rifampicin, identified as a potent drug, along with other drugs in uniform multi-drug treatment, has a significant effect when given to leprosy patients at initial stages. These are effective treatments but a specific drug for leprosy is still needed to be identified. The review of Aamir et al., Recent Advancement in the Diagnosis and Treatment of Leprosy, highlights the use of modern methods for the identification of leprosy at its earlier stages and the effective use of drugs alone as well as in combination.

The manuscript of Hazra & Patra entitled Alleviating the Neglected Tropical Diseases: Recent Developments in Diagnostics and Detection discussed various novel research progresses/advancements made for qualitative and quantitative meas-
urement of infectious load in some diseases like dengue, Chagas disease and leishmaniasis; though further improvements in the specificity and sensitivity front are still awaited. Strategies to combat the problem of antimicrobial drug resistance in the diagnosis of NTDs have also been put forward by various research groups and organizations. Moreover, the state-of-the-art “omics” approaches like metabolomics and metagenomics have also started to contribute constructively towards diagnosis and prevention of the NTDs.

The aim of the study by Khan and co-workers, Formulation and Characterization of a Self-Emulsifying Drug Delivery system (SEDDS) of Curcumin for the Topical Application in Cutaneous and Mucocutaneous Leishmaniasis, was to develop a Self-Emulsifying Drug Delivery System (SEDDS) for the hydrophobic polyphenol pigment curcumin to enable it for its potential use in cutaneous and mucocutaneous leishmaniasis. The results demonstrated that the SEDDS formulations of curcumin have the potential to provide a promising tool for curcumin for its use through topical routes in the treatment of these diseases.

Through virtual screening of a chemical library of 15,123 small molecules, analyzed by two programs, four potential inhibitors of phosphoglycerate mutase 1 from *P. falciparum* were found by Rios-Soto et al. The study was reported in the manuscript entitled Virtual Screening, Molecular Dynamics and ADME-Tox Tools for Finding Potential Inhibitors of Phosphoglycerate Mutase 1 from *Plasmodium falciparum*. Molecular dynamic analysis revealed that these molecules interact with residues important for enzyme catalysis and molecule ZINC04343691 provoked the highest structural changes. Physicochemical and toxicological profiles evaluation of these inhibitors with ADME-Tox method suggested that they can be considered as potential drugs. Furthermore, analysis of human PGAM-B suggested that these molecules could be selective for parasitic enzymes.

In the manuscript of Thomas & Timson, entitled The Mechanism of Action of Praziquantel: Some Hypotheses; the authors discussed that there is a critical need to understand the biochemical pharmacology of the praziquantel in order to inform the discovery of the next generation of anthelmintic drugs.

We, the Guest-Editors, would like to express our gratitude to the many authors who contributed to this special issue, reporting investigations of various aspects of **Recent Advancement against Neglected Diseases**.

**REFERENCES**


Luciana Scotti  
(Guest Editor)  
Current Topics in Medicinal Chemistry  
Cheminformatics Laboratory- Postgraduate Program in Natural Products and Synthetic Bioactive, Federal University of Paraíba, Health Center, 50670-910, João Pessoa, PB, Brazil  
Teaching and Research Management – University Hospital, Federal University of Paraíba-Campus I, 58051-970, João Pessoa, PB, Brazil  
E-mail: luciana.scotti@gmail.com

Marcus Tullius Scotti  
(Guest Editor)  
Current Topics in Medicinal Chemistry  
Cheminformatics Laboratory- Postgraduate Program in Natural Products and Synthetic Bioactive, Federal University of Paraíba, Health Center, 50670-910, João Pessoa, PB, Brazil  
E-mails: mtscotti@gmail.com; mtscotti@ccae.ufpb.br

Nagendra Sastry Yarla  
(Guest Editor)  
Current Topics in Medicinal Chemistry  
Department of Biochemistry/Bioinformatics Institute of Science, GITAM University, Visakhapatnam, A.P India  
E-mail: sastryyn@gmail.com