Tentative Outline

Special Thematic Issue for the journal "Current Drug Target" (CDT)

Title of the Thematic Issue: <u>Pharmacogenetics in Personalized Medicine: underlying mechanisms and practical applications</u>

Guest Editor: Dr. Jincheng Wang

- **Scope of the Thematic Issue:**

Pharmacogenetics establishes relationships between pharmacology and genetics by connecting phenotypes and genotypes in predicting the response of therapeutics in individual patients, which is one of the emerging approaches to precision medicine, tailoring drug selection and dosing to the patient's genetic features. Personalized medicine is a rapidly developing field of clinical practice that uses new technologies to provide decisions regarding the prediction, prevention, diagnosis, and treatment of disease. The continuous evolution and development in molecular diagnostics and genomic analysis methods facilitate our understanding and interpretation of the human genome and epigenome, paving the way for "personalized" medicine to be applied in the clinic.

Understanding pharmacogenetic differences in drug response and tolerability have been an important area of research in personalized medicine, but the clinical utility of pharmacogenetics testing has not been established. Identification of genetic polymorphisms due to single nucleotide polymorphisms is the most common approach, but this does not take into account the potential relevance of copy number variants, noncoding RNA gene regulation, gene-gene and gene interactions, and epigenetic modifications, which increase the complexity of pharmacogenomics research. Multidisciplinary input and collaboration are increasingly key to interpreting the significance of genomic results. Recently, big data analysis has attracted great attention in personalized medicine, because an abundance of data can be supplied by multifaceted technologies. Large-scale, heterogeneous data sets processed by sophisticated algorithms may help to identify optimal therapeutic strategies otherwise unidentifiable, shedding light on pharmacogenetics and personalized medicine.

Keywords: Pharmacogenetics; Genomics; Therapeutic response; Computational approach; Personalized medicine; Drug selection; Molecular diagnostics; Big data analysis

Sub-topics:

- ➢ Mechanisms explorations into genetic/epigenetic alterations and therapeutic strategies of human diseases
- ➢ Explorations into the effects of genetic/epigenetic alterations on the diagnosis and prognosis of human diseases
- ➢ Computational methods revealing the interaction between pharmacogenetics and personalized medicine
- ➢ Image biomarkers and radiomics for personalized medicine
- ➢ Multi-omics data and analysis for personalized medicine
- ➢ Network pharmacology analysis to investigate the mechanisms underlying pharmacogenetics

Schedule:

- ➢ Thematic issue submission deadline: <u>30 October 2023</u>

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