Biochemical Mechanisms and Therapeutic Strategies in Gastrointestinal and Metabolic Disorders

Rohit Gundamaraju, Ravichandra Vemuri, Rajaraman Eri, Luiciana Scotti, and Marcus Scotti

Though there are numerous ongoing trials on gastro-intestinal (GIT) disorders, there is not much of reduction in mortality observed. On the other hand, the global epidemic of GIT continues to progress relentlessly. Yet existing drug classes for GIT disorders have substantial limitations. Majority of the reliability of drug discovery lies in medicinal chemistry. There are innumerable abrupt changes in the medicinal chemistry especially in 3D structure analysis, high throughput screening and various novel interventions. Utilization of chemical entities novel or modified can be targeted against the dreadful carcinomas via these modern techniques. In an instance, the majority of the colorectal cancers are targeted by virtue of chromosomal instability but some types like microsatellite unstable cancers which are drug-resistant do not respond to chemotherapy agents which is a huge challenge. This clearly shows that there is a high need for augmentation of therapeutics. Presently, alongside synthetic molecules peptides and proteins are contending to tackle cancers. The striking supremacy of proteins includes less intrinsic, tissue penetration and better targeting. It is a known fact that inhibition of apoptosis in the condition of cancers leads to an escalation in the aggression of metastasis. Thus, manipulation or promotion of apoptosis can lead to a reduction of metastasis and improve life expectancy. On the other hand, despite the advent of new drug classes, the global epidemic of the cardio-vascular and metabolic disease has not abated. Continuing unmet medical needs remain a major driver for new research. Drug discovery approaches in this field have mirrored industry trends, leading to a recent increase in the number of molecules entering development.

Previously, we successfully published the issue “Novel interventions and therapeutic targets in gastro-intestinal (GI) and metabolic disorders” (Raj et al. 2017) in Current Pharmaceutical Design [1]. However, the issue was limited to a wide range of interventional targets for GI and metabolic diseases, but their biochemical pathways and molecular targets were not addressed. Thus, this special mini thematic issue would thus handle the novel interposing in GIT and metabolic disorder, their underlying mechanisms such as autophagy, anti-apoptotic pathways in intestinal cancers etc. The thematic issue would also focus on Biochemical pathways and the importance of interventions in designing a better and promising molecule.

In this special issue, Dostie et al. demonstrated the importance of proper therapeutic targets for Inflammatory Bowel Disease (IBD). They suggested that Metallothionein (MT) could be the possible targets for the IBD. The release of MT results in activation of inflammatory responses leading to progressive inflammation and subsequent expansion of MT synthesis [2]. Rohini et al. discussed the causes of gastrointestinal diseases and the present state of various therapeutic strategies such as probiotics as live biotherapeutics and Fecal Microbial Transplants (FMT’s). The authors’ have recommended live biotherapeutics and FMT’s could be suitable and successful alternatives to conventional therapies in mitigating the gastrointestinal pathogens.

Vinoth and colleagues in their review have discussed about Blastocystis sp., a protozoan parasite and its association with GIT disorders and possible therapeutic targets [3]. They suggested Metronidazole as is the first-line drug of choice. Another treatment option is the combination therapy with trimethoprim/sulfamethoxazole.

Rohit et al. have reviewed the pathways of intrinsic cellular stress such as oxidative stress and autophagy, Endoplasmic Reticular Stress (ERS) and mitophagy and apoptosis as fate in cell stress. They indicated that the stress responses are a hallmark of numerous degenerative diseases including neurodegenerative diseases, diabetes, and cancer [4]. Understanding the cross-talk between different intrinsic cell stress responses will help to develop new therapeutic targets.

Taken together, the special thematic issue aids in therapeutic and biochemical targets and focused nature of rational pharmaceutical design. I would like to thank all the authors and co-authors for their excellent contributions. Above all, I would like to acknowledge the support from Dr. Kazim Baig, and Aamer M. Khan from Current Pharmaceutical Design publishing team for their endorsements in compiling this issue. Considering specialized and superlative articles in the field of gastroenterology and pathophysiology, we hope that readers will find in
this issue new broadways of research. As a guest editor(s), we would sincerely thank and acknowledge the diverse group of experts and colleagues who offered their substantial reviewing efforts and suggestions.

**Keywords:** GIT disorders, metabolic disorders, therapeutic targets, inflammatory bowel disease, probiotics, immune signaling, pathophysiology, Fecal microbiota transplantation.

**REFERENCES**


Rohit Gundamaraju, Ravichandra Vemuri and Raj Eri

School of Health Sciences,
College of Health and Medicine
University of Tasmania,
Launceston,
Tasmania,
Australia 7248

E-mails: rohit.gundamaraju@utas.edu.au
ravichandra.vemuri@utas.edu.au
rderi@utas.edu.au