Editorial

Long Non-coding RNA and microRNAs as Novel Potential Biomarker and Therapeutic Target in the Treatment of Gastrointestinal Cancers

Gastrointestinal cancers are one of most common chronic diseases and are among the top three causes of mortality in the world. Despite extensive improvements in surgery, chemotherapy, radiotherapy and target therapy over the last decades, the outlook for patients remains miserable, with short survival in advanced cancer stages and recurrence. Long non-coding RNAs (lncRNAs) are non-protein coding RNA molecules more than 200 nucleotides which regulate gene expression. IncRNAs plays an important role in initiation, development and metastatic behavior of various tumors. MicroRNAs (miRNAs) are evolutionary conserved, short (~22 nucleotides in length), single-stranded RNA molecules that attributed to the big family of small non-coding RNAs. MiRNAs contribute in the tumorgenesis as either tumor suppressors (oncouspressor) or oncogenes (oncomiR). IncRNAs may function as competing endogenous RNAs (ceRNAs) to attract miRNAs, therewith modulating the derepression of target miRNA. LncRNAs and micro-RNAs can be circulated in body fluid, suggesting their values as non-invasive predictor marker of cancer diagnosis, classification, prognosis, and response to treatment.

The thematic issue provide the readers working in basic biomedical sciences as well as clinicians a comprehensive overview on diagnostic, prognostic significance and targeting lncRNAs and miRNAs in gastrointestinal cancers.

In this issue, Gaarajová and co-workers [1] provide an overview about association of noncoding RNA in pancreatic cancer with respect to their application as diagnosis, prognosis and therapeutic target. Furthermore they discuss the influence of non-coding RNAs in the metastatic behavior of pancreatic cancer, and the role of diet in epigenetic regulation of non-coding RNAs, which can lead to the development of novel prevention approaches or targets for cancer therapy.

The review entitled “Role of regulatory oncogenic or tumor suppressor miRNAs of PI3K/AKT signaling axis in the pathogenesis of colorectal cancer” explored the regulatory miRNAs of PI3K/AKT/mTOR signaling as represent novel biomarkers for new patient diagnosis and obtaining clinically invaluable information from post-treatment CRC patients for improving therapeutic strategies [2].

Moradi-Marjaneh and co-authors review TGF-β signaling pathway which plays an important role in normal intestinal tissue function and development of CRC. In this study, they summarized the data of interaction between TGF-β signaling pathway and miRNAs to better understand the molecular mechanisms in CRC [3].

Ghanaatgar-Kasbi et al., investigated the therapeutic potential of targeting c-mesenchymal-epithelial transition factor (c-MET) pathway via novel HGF/Met inhibitors in pancreatic cancer, since this pathway is among the key dysregulated pathway in pancreatic cancer and its overexpression is reported to be associated with poor prognosis and chemo-resistance [4].

Another study entitled “Phytosomal curcumin elicits anti-tumor properties through suppression of angiogenesis, cell proliferation and induction of oxidative stress in colorectal cancer” investigated the anticancer activity of phytosomal curcumin, in colorectal cancer [5]. Curcumin is a bioactive compound of the spice-herb turmeric or Curcuma longa and has been widely investigated for its anticancer activities in various types of cancer cell lines and in vivo tumor models. However, curcumin application in the clinic has been limited due to its poor solubility, low oral bioavailability and rapid metabolism which has resulted in attempts to improve curcumin formulations. Phytosomal curcumin is a novel formulation could overcome the limitations of conventional delivery systems, exerts sustained release and optimize the curcumin absorption and bioavailability. Moreover, phytosomal technology enhances absorption following oral administration and also has a liver protective effect due to phosphatidylcholine used in its preparation. Khazaei et al. showed that phytosomal curcumin has anti-tumor properties through suppression of VEGF signaling regulatory miRNAs, cell proliferation and induction of oxidative stress in colorectal cancer.

Helicobacter pylori infection is considered as the most important risk factor for gastric cancer (GC). Although H. pylori is associated with acute and chronic inflammation of gastric epithelium, it has been recognized as an important carcinogen for GC. There is growing body of data showing that H. pylori is related with dysregulation of microRNAs expression. Parizadeh and co-workers provide an overview about recent studies investigated the different expression of tissues miRNAs depends on Helicobacter pylori infection and effect of these different expression on development and progression of Gastric cancer [6].

The review of Javadinia et al., summarized the current status on Phosphatidylinositol 3-kinase/AKT/Mammalian Target of Rapamycin (PI3K/AKT/mTOR) pathway and their cross regulation with a focused on the value of targeting this pathway as a potential therapeutic target in treatment of esophageal cancer, since overexpression of this pathway is associated in the development, and prognosis of esophageal cancer [7].

Asgharzadeh and colleagues investigated the therapeutic application of Angiotensin-converting enzyme and angiotensin receptor (ACEIs/ARIs) inhibitors in the treatment of colorectal cancer [8].

Fani et al. discussed the interaction of dysregulated miRNA by different viral infection, such as EBV, HSV1&2, KSHV, MHV68, CMV, Polyoma virus, Adeno Virus, HBV, HAV, EBOV [9].

Another study by Amerizadeh et al., explored discuss current circumstances and future outlooks of targeting angiogenesis using novel VEGF inhibitors and small noncoding microRNAs in gastrointestinal cancers [10].

Rezaei and colleagues present recent advances on electrochemical detection assays, which has strikingly gained the ultrahigh sensitivity and selectivity. This review summarizes the drawback of current detection methods and also highlights the recent advances on the biosensory methods as point-of-care devices which can able to measure the circulating miRNAs in various cancers [11].

Finally we hope these multidisciplinary topics discussed with the theme issue, promote further discussion among current status and future prospective of Long non-coding RNA and microRNAs as novel potential biomarker and therapeutic target in the treatment of gastrointestinal cancers. As the guest editors, we would like to thank all the authors and co-authors for their excellent contributions. furthermore, we would sincerely thank and acknowledge the diverse group of experts and colleagues who offered their substantial reviewing efforts and suggestions. Last but not least, we would like to express our gratitude to the Bentham Science Publishers for the wonderful experience on this thematic issue and Prof. William A. Banks, Editor-in-Chief of Current Pharmaceutical Design to give us this opportunity to publish this issue. Also It
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