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Is use of micro-RNA-containing food feasible for nutrition and health?

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Micro-RNAs (mi-RNAs) are a class of small non-coding single-strand RNA molecules (22 nt in length) that play an important role in inhibition of translation or degradation of targeted messenger RNAs (mRNAs) by binding 3'-untranslated region (UTR) of target mRNAs. mi-RNAs are involved in diverse physiological and pathological processes, including apoptosis, cell proliferation, the cell cycle, carcinogenesis and skeletal muscle function. On this basis, mi-RNAs can be used to combat disease and maintain health. mi-RNAs may also facilitate development of enhanced food or feed. We assessed 3 factors required for use of mi-RNAs in food: stability, safety, and efficacy. This review highlights emerging evidence in the use of mi-RNAs as ingredients in food or animal feed. Dietary mi-RNA, such as plant mi-RNAs and milk mi-RNAs, we confirmed the possibility of their application in food or animal feed. mi-RNAs stable under harsh conditions (pH 1, RNase, 37^0C) which is associated with their packaging into vesicles, including exosomes and micro vesicles. In addition, ingested mi-RNAs can regulate human gene expression with cross-kingdom activity. We also discuss the challenges to, and perspectives for, the application of mi-RNAs. As found, additional role of nutrients on the indirect inhibition of the gene via mi-RNA, synergic effect between nutrients and dietary mi-RNA would also be possible. The relationship between foods and mi-RNAs is highly associated at the epigenetics mechanistic support. Therefore, mi-RNAs or mi-RNA-containing biomaterials (anti-sense oligonucleotides or mimic nucleotides) may be useful functional food ingredients to prevent and treat various diseases.

Biography

Lee Jeong-Sang has completed his PhD from Seoul National University College of Pharmacy (Biochemistry major) and Post-doctoral training from Yale University School of Medicine (Comparative Medicine and Pharmacology). He is now serving as the Director of M F Laboratory of Jeonju University. He has published 45 papers in reputed journals and has been serving as Editorial Board Members of *Journal of Food Chemistry & Nanotechnology* and *Frontier in Bioscience*. He has been studying cancer prevention research especially focusing on gastro-intestinal inflammation. He expanded his expertise to translational research, utilizing human patient samples (gastritis, colitis, gastric and colon cancer).

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