SMGroup

SM Journal of Pharmacology and Therapeutics

Editorial

Exosomes

Jian-ye Zhang*

School of Pharmaceutical Sciences, Guangzhou Medical University, China

Article Information

Received date: Jun 02, 2016
Accepted date: Jun 03, 2016
Published date: Jan 02, 2017

***Corresponding author**

Jian-ye Zhang, School of Pharmaceutical Sciences, Guangzhou Medical University, China, Email: jianyez@163.com

Editorial

Intercellular communication is widespread physiological phenomenon, which has great significance for growth, differentiation, and apoptosis in organism. Exosomes, endosome derived vesicles (30-100nm) shed by cells in processes of cellular housekeeping and communication, serves important roles in cellular communication both locally and distally.

Exosomal release begins with endocytosis, follows the endosomal pathway, and ends with exocytosis. Numerous studies have shown that the exosomal process is abnormal in cancer. More exosomes are secreted by cancer cells than healthy cells, but more significantly, the content of cancer cells is distinct.

Cancer derived exosomes contain a wide range of content composed of functional proteins, lipids, DNA, mRNAs, and microRNAs. There are a number of specific protein markers expressed in exosomes, including (i) membrane transport and fusion proteins, such as annexins, Rab proteins, and flotillin; (ii) tetraspanins, such as CD9, CD63 and CD81; (iii) heat shock proteins (HSPs), such as Hsp70 and Hsp90; (iv) proteins involved in MVBs biogenesis, such as Alix and TSG101; (v) cytoskeletal proteins, such as actin.

MicroRNAs, another principal component, are considered to be one of the most distinguishing hallmarks of cancer derived exosomes. It's illustrative that many microRNAs are tumor-specific and therefore can be used as diagnostic and prognostic biomarkers. They can be associated with the RNA-Induced Silencing Complex (RISC), which is novel for processing mature and biologically active microRNA. MiR-21, MiR-200 families *et al* were found to be aberrant in many kinds of cancer and considered as biomarkers for cancer. However, a great deal remains unclear about the mechanisms of microRNAs regulating tumor condition.

Exosomes are involved in dysregulation of cancer and take effect in formation of primary tumors, metastasis and immunological responses. Exosomes can function in metastatic invasion, transformation and establishment of pre-metastatic niches. Exosomes can promote the drug resistant microenvironment, sequester and extrude drugs, and transform a non-resistant cell into a resistant cell through functional drug efflux pumps (such as ABCB1). Exosomes can regulate the immune system through antigen presentation, immune activation, immune suppression, and modulating the complement system.

Given that exosomes possess different proteins and microRNAs which can reflect the characteristic of derived cells and that exosomes play an important role in development and progression of cancer, there is a substantial opportunity for creating molecular diagnostics and prognostics as well as real-time monitoring of therapies based on patient biofluids exosomes analysis. Therefore, more investigations on exosomes function and application are needed to dig out a novel effective biomarker for cancer.