

عنوان مقاله:

The emergence of micro-isolator devices for high throughput exosome analysis: A technological leap towards personalized cancer treatment

محل انتشار:

دومین کنگره بین المللی پزشکی شخصی (سال: 1396)

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خلاصه مقاله:

Exosomes, as the noteworthy extracellular compartments of liquid-biopsies, are vehicles aid the displacement of biomolecules (lipids, proteins and/or nucleic acids). Hence, they can play pivotal roles in cancer pathogenesis. The diversity of the exosomes contents which dynamically reflects bio-situations, has made them a valuable biomarker for theranostic applications which fits the personalized medical attitudes. The role is more outstanding in the case of cancer as a complex disease. In these situations, using exosomes as personalized theranostic biomarkers demands the rise of rapid, precise and affordable technology. This has been recently achieved by the emergence of microfluidic technology which facilities exosome isolation and analysis. Both physical and biological characteristics of exosomes have been used to design Lab-On-Chip micro-isolators. In bio-based isolators, exosome specific antibodies are immobilized on solid surfaces, specifically capture the vehicles. While, physical separators can either make use of particles' physical properties and/or physical forces (size-based separations on nonporous membranes and on-chip acoustic nano-filtration, respectively). Development of on-chip nanowires for trapping exosome-like vesicles and deterministic lateral displacement micro-sorter (based on the different displacement patterns of the large and small particles) are the other examples of micro-fabrications for exosome analysis. Micro-isolators have proved that microfluidic technology has dramatically increased the efficiency of exosome-based analysis. Although at their infancy, micro-platforms have provided more accessible, affordable and convenient devices than today's conventional instruments (ultracentrifugation and size-exclusion-chromatography). They also provide more accurate and reproducible results but to fit the newly emerging personalized medicine in future they tend to be accompanied by downstream bio-analysis.

کلمات کلیدی:

Exosomes; Microfluidic; Personalized medicine; Micro-isolator; Cancer diagnosis

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