Biomedical instrument based on microvesicles

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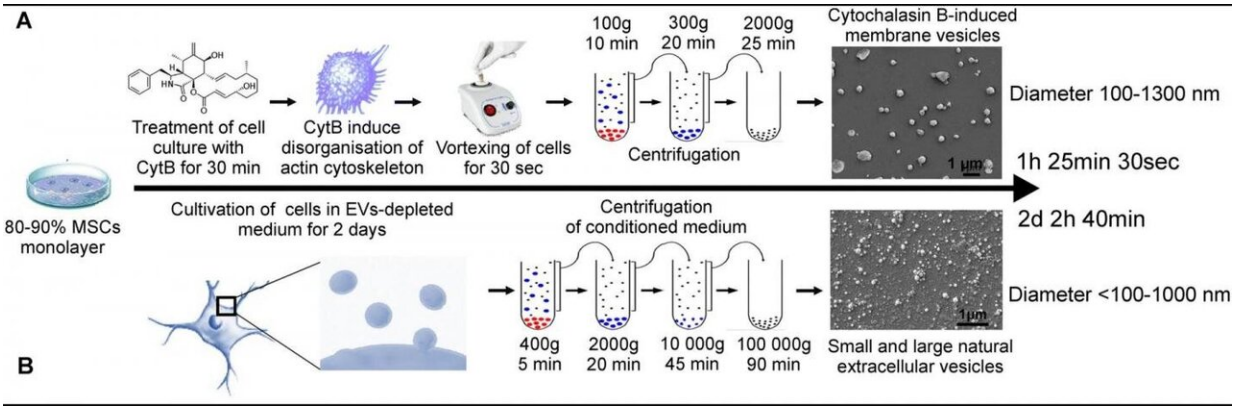

Production of cytochalasin B-induced microvesicles (A) and natural EVs (B). Schematic of isolation procedure, time required for isolation, representation of CIMVs and EVs size. Credit: Kazan Federal University

Researchers have proved that a microvesicle-based instrument can be effective in reducing inflammation and immune response.

Group leader, Senior Research Associate Marina Gomzikova explains how microvesicles—bubbles surrounded by a natural cell membrane—can be biocompatible therapeutic instruments.

"We created a technology to obtain microvesicles from human stem cells and showed that they have significant biological activity and therapeutic

potential. Microvesicles are basically miniature copies of cells. But, unlike stem cells, they are not oncogenic and can be a safe treatment medium," she says.

The authors compared the activity of induced microvesicles with natural microvesicles and stem cells. The results show that induced microvesicles indeed can reduce the intensity of immune response.

"The uniqueness of induced microvesicles is that their technology is scalable and can be implemented at an industrial level. A new class of biomedical compounds can be based on microvesicles. The immunomodulating activity may be used to treat inflammations and autoimmune syndromes," adds Albert Rizvanov, Director of Kazan Federal University's Center for Precision and Regenerative Medicine.

Induced microvesicles can further down the road serve as vehicles to deliver medications against nervous system injuries, locomotor damage, ischemia, and many other illnesses. In contrast to stem cells, microvesicles can be prepared in large quantities, are easily stored and utilized even in facilities not equipped with biobanks or cell labs.

More information: M. O. Gomzikova et al, Immunosuppressive properties of cytochalasin B-induced membrane vesicles of mesenchymal stem cells: comparing with extracellular vesicles derived from mesenchymal stem cells, *Scientific Reports* (2020). DOI: 10.1038/s41598-020-67563-9

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