Exosome-Mimicking Nanovesicles

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ABSTRACT

Researchers at the University of California, Davis have developed a method of synthesizing stem cell-derived, exosome-mimicking, nanovesicles that have the therapeutic potential to rescue apoptotic neurons in culture.

FULL DESCRIPTION

Neurological disorders are devastating - often leading to irreversible neuron damage or loss. Current treatment options for such conditions frequently only help manage patient symptoms, falling short of halting or reversing the neuronal damage. Therefore, the need for more comprehensive and effective treatment options has stimulate multiple avenues of research.

Exosomes secreted by human, placental-derived, mesenchymal cells (PMSCs) have demonstrated the potential for alleviating the severity of neuronal damage. Since their membrane composition is similar to that of a plasma membrane, exosomes are an excellent candidate for cell-free therapy. They are biocompatible and facilitate targeted delivery. However, exosome composition is variable, their isolation process is time-consuming and production yields are often low. Therefore, an alternative solution is needed to overcome these challenges.

Researchers at the University of California, Davis have developed a method of synthesizing stem cell-derived, exosome-mimicking, nanovesicles (EMNs). These nanovesicles are similar to native exosomes in size, composition and biological functions. The EMNs can be used to package biological materials such as stem cell secretomes and therapeutic drugs, and can be synthesized using PMSC-derived lipid rafts. The developed process allows the EMNs to be produced at high yields. These nanovesicles are completely cell-derived and retain cell surface markers that likely help in the targeted delivery of these vesicles to specific cells. Moreover, this technology has demonstrated the therapeutic potential to rescue apoptotic neurons in culture.

APPLICATIONS

· Potential platform technology with the capability to deliver therapeutics effective in treating or managing neurological disorders

FEATURES/BENEFITS

· Cell-derived

· Can be personalized (autologous therapy)

· Possess surface receptors for targeted delivery

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	2022028796	09/15/2022	2019-781

INVENTORS

- Wang, Aijun

OTHER INFORMATION

KEYWORDS

Stem cells, exosomes, placental-derived mesenchymal cells, MSCs, drug delivery, neurons, lipid raft, platform technology

CATEGORIZED AS

- **Biotechnology**
  - Health
- **Medical**
  - Delivery Systems
  - Disease: Central Nervous System
  - Stem Cell
  - Therapeutics
- **Nanotechnology**
  - NanoBio

RELATED CASES

2019-781-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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