

Encapsulation Method of Adenoviral Vectors in Liposomes

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BACKGROUND

Clinical trials have shown that oncolytic viruses can be systemically delivered safely with limited toxicity; however, several limitations are reached in terms of efficacy. Adenoviruses are commonly used in gene therapy for cancer and are predominantly derived from adenovirus serotype 5 (Ad5), due to their ability to infect a broad range of cells. Although local, intratumoral administration of Ad have produced marked antitumor effects in cancer gene therapy, additional work is required to develop an Ad vector system for systemic administration that can be used to treat both primary and metastatic tumors. Several drawbacks are attributed to rapid clearance of the virus from circulation before they reach their target site. Clearance from the bloodstream is mediated through neutralizing antibodies, inflammatory responses, as well as nonspecific uptake by other tissues such as the lung, liver, spleen, and suboptimal viral escape from the vascular compartment. A range of methods have been designed to overcome these limitations. In general, encapsulation of the virus with a cationic liposome or coating the viral capsid with a cationic polymer has been employed.

TECHNOLOGY DESCRIPTION

University researchers have developed methods and compositions for liposomal encapsulation of adenovirus which enable improved oncolytic viral therapy for cancer treatment. The overall procedure has been shown to have high encapsulation efficiency while retaining viral infectivity. The invention overcomes the immune response to increase tumor uptake and enhance therapeutic efficacy of oncolytic viruses in cancer cells. The developed method has shown that non-targeted encapsulated viral particles retain their ability to transfect cancer cells. In addition, surface functionalization of the liposomes may be applied to specifically target cancer cells and to compensate for decreased infectivity due to viral encapsulation.

INTELLECTUAL PROPERTY INFO

This invention is available for research sponsorship and/or licensing.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,113,151	10/30/2018	2013-089

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OTHER INFORMATION

KEYWORDS

oncolytic viruses, adenoviral vectors, encapsulation, liposome

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