

Encapsulation Method of Adenoviral Vectors in Liposomes

► Asset Overview

Product Type	Oncolytic adenovirus liposomal formulation (Gene Therapeutic)
Indication	Oncology
Current Stage	Discovery
Target (MoA)	Tumor antigen binding and phagocytosis via genetically reprogrammed macrophage
Brief Description	UC San Diego researchers have developed methods and compositions for liposomal encapsulation of adenovirus. 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.
Organization	University of California, San Diego

► Differentiation

□ Unmet Needs

- Innate immunogenicity of viral particles and preexisting adaptive immunity prevent oncolytic viral vectors from being efficiently administered via systemic route, making it difficult to deliver the virus intravenously to distant or surgically inaccessible tumor sites

□ Innovations

- Lecithin liposome can encapsulate the adenovirus in efficient manner
- Adenovirus encapsulated in lecithin liposome is more resistant to neutralization by adenovirus-specific neutralizing antibody
- Adenovirus encapsulated in lecithin liposome shows higher blood retention profile than naked virus
- Surface modification of lecithin liposome with folate ligand leads to higher level of adenovirus internalization than control lecithin liposome formulation in folate receptor overexpressing cancer, demonstrating that other targeting may be incorporated to further improve tumor-specific delivery of lipoplex in the future

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Key Data

Folate ligand improves liposomal adenovirus uptake

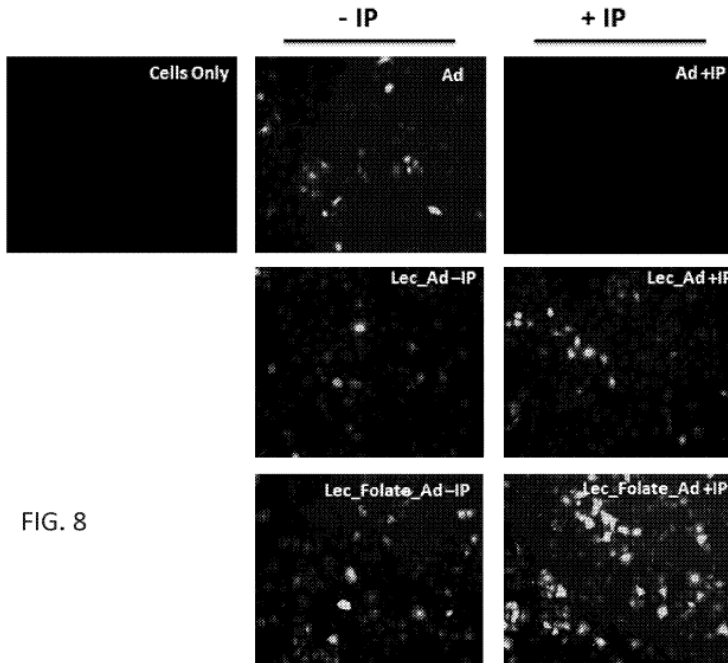


FIG. 8

FIG. 8 illustrates a significant increase in infectivity of viral particles encapsulated in lecithin liposomes which bear a ligand for a folate receptor.

Improved blood retention of systemically administered adenovirus

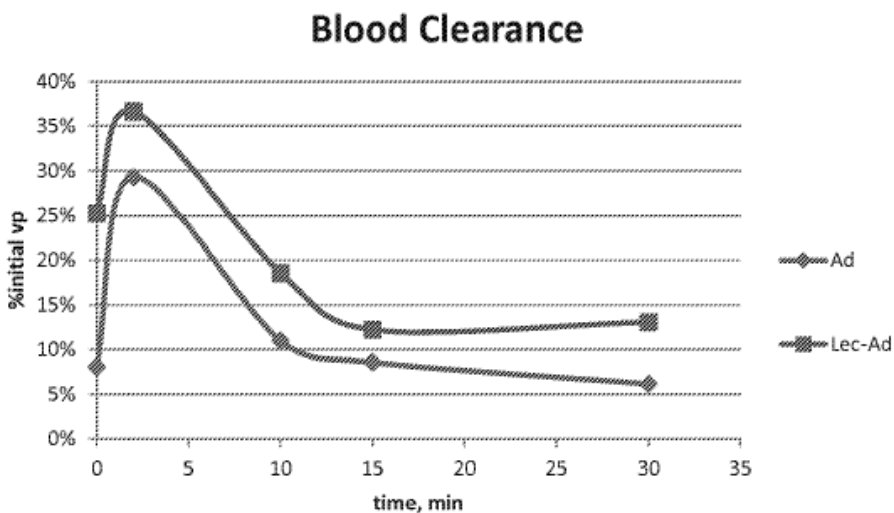


FIG. 9 illustrates clearance of viral particles encapsulated in lecithin liposomes from blood after IV administration.

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► Intellectual Property

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