NEW CYCLODEXTRIN-BASED GEMINI SURFACTANTS DRUG DELIVERY SYSTEMS

Opportunity

Researchers at the University of Saskatchewan have designed and evaluated new drug delivery systems composed of cyclodextrin-based gemini surfactants.

The systems can significantly improve therapeutic effect of drugs used for skin tumors.

Our solution

- Superior cellullar toxicity for melanoma cells compared to the currently used drug, melphalan (a 50-100 fold higher cytotoxicity).
- Enhances drug uptake by cells.
- Promotes drug retention in cancer cells.
- Facilitates passage through protective layer of skin, i.e. increases drug permeability.
- Allows topical non-invasive application of cancer treatment.

Background

The importance of efficient drug delivery system with high cell permeability is crucial in the treatment of skin derived cancers. Efficient drug delivery system is not only enhances therapeutic effect of the drug but also possesses no toxic effect on healthy tissue.

Current drug delivery systems for skin cancer possess limited permeability effect, often require system administration, provide low drug retention by cancer cells and possess cytotoxic effect for healthy cells.

Global market for drug delivery systems amounted to $139 billion in 2009 while transdermal delivery systems market reached $5.6 billion.

Patent status

US provisional patent applications filled on May 20, 2011.

Publications

Michel D, Chitanda JM, Balogh R, Yang P, Sing J, Das U, El-Aneed A, Verrall R, Badea I. Desighn and evaluation of cyclodextrin-based delivery systems to incorporate poorly soluble curcumin analogs for the treatment of melanoma. – submitted to Molecular Pharmaceutics.

Singh J, Yang P, Michel D, Verrall RE, Foldvari M, Badea I. Amino Acid-substituted gemini surfactant-based nanoparticles as safe and versatile gene delivery agents. Curr Drug Deliv. 2011 May 1;8(3):299-306.

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