

Unique Polymeric Micelles Based on Natural Compounds for Drug Delivery

Reference: VAL-602-UM

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Background

To reach market, several drugs are in need of efficient DDS to improve their bioavailability and optimize efficacy.

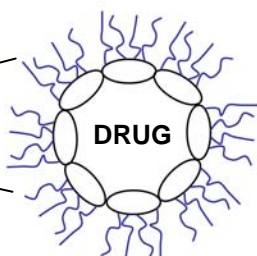
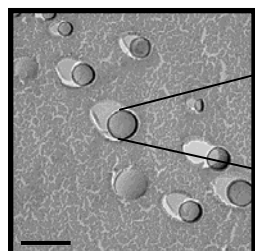
Recently, polymeric micelles have emerged as delivery medium for injectable drug formulation of poorly water-soluble drugs. In addition, active research is being performed in the field of oral formulation using polymeric micelle. Polymeric micelles offer great stability in biological systems allowing the retention of loaded drugs for a longer period of time and, eventually, achieving more efficient access to a drug at the target site.

Technology

The technology, developed by Dr. Zhu from the *Université de Montréal*, is a novel polymeric micelle-based drug delivery system.

This novel polymer is composed of a natural compounds, cholic acid, functionalized with four poly(ethylene glycol) (PEG) chains of varying lengths. In water, these polymers can form stable spherical micelles forming a hydrophobic core with a hydrophilic shell.

Results



Schematic magnification of the micelle

Figure 1: Transmission electron microscopic photograph shows formation of spherical micelles with a relatively small size. Bar = 200 nm.

Applications

- These polymeric micelles could be used as a drug delivery vehicle for compounds that exhibit poor solubility in water, undesired pharmacokinetics and/or low stability, such as paclitaxel, doxorubicin, cyclosporine, indomethacin, amphotericin C and dihydrotestosterone.
- Formulation of cosmetic products and oral cleansing products for the incorporation of active ingredients with low water-solubility.

Competitive Advantages

- **Unique composition.**
- **Biocompatibility.** The use of bile acids as building blocks ensures a low toxicity of the degradation products. Also, the outlayer of PEG favors reduction of immunogenicity.
- **Low cost of production.**
- **Adaptability to drug target.** PEG can be functionalized with various antibodies, peptides, and other compounds to enhance drug targeting after systemic delivery.

Patent Status

PCT patent application filed (Q4/2008)

Business Opportunity

Seeking partnership with pharmaceutical company wanting to increase efficacy in the delivery of drugs and other active agents.

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