

ORAL PRESENTATIONS

LOW-MOLECULAR-WEIGHT OLEYL HYALURONAN AS A POLYMERIC CARRIER IN NOVEL DRUG FORMULATIONS

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Oleyl hyaluronan is an amphiphilic conjugate of low-molecular-weight hyaluronan and oleic acid that forms self-assembled micelles with a hydrophobic core and a hydrophilic shell. This property is widely used for solubilization of poorly soluble compounds and for the development of drug delivery systems for various application. In the present study, the possibility of using oleyl hyaluronan micelles as a drug-loaded platform for intravenous, intra-articular, and topical administration was investigated. Various instrumental analytical methods were employed, and technological approaches were optimized.

It was shown that loading of antitumor drugs, including paclitaxel, etoposide, and its prodrug, makes it possible to obtain micellar systems potentially suitable for intravenous administration. These structures are characterized by a stable release profile over two days, efficient internalization into MDA-MB-231, MCF-7, and 4T1 cells, and higher cytotoxicity that substantially exceeds the toxicity of the free pharmaceutical substances.

For intra-articular application, a glucocorticoid-loaded formulation was developed using methylprednisolone as a model compound. This formulation provides rheological similarity to synovial fluid, as shown by rheological studies, achieves the therapeutic dose of 40 mg per injection, and slows drug release by 30% over 30 days compared with the clinically used formulation Depo-Medrol®.

In addition, a composition based on a combination of oleyl hyaluronan micelles loaded with the phytoestrogen tefestrol and high-molecular-weight hyaluronic acid was proposed for topical use, including intravaginal and cutaneous application in the mammary gland area. The phytosubstance was provided by the Institute of the Chemistry of Plant Substances, Republic of Uzbekistan. This approach was shown to stabilize tefestrol, increase its concentration up to 2 mg/mL, and ensure prolonged release in a medium simulating vaginal fluid over two days.

Thus, the use of oleyl hyaluronan as a matrix for the development of drug formulations with different routes of administration and controlled release was demonstrated to be promising.

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