

Design of Hydrotropic Polymer Systems for Solubilization of Poorly Water Soluble Drugs

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Many drugs and drug candidates often have problems in formulations due to their poor water-solubility. For example, paclitaxel is an anticancer agent effective against a wide range of tumors, but its clinical applications have been limited due their extremely low water-solubility ($< 1 \mu\text{g/ml}$). Thus, many studies have focused on developing effective solubilization systems for poorly water-soluble drugs, but only with limited successes.

Recently, our research groups have introduced new polymeric systems known as the hydrotropic polymer, hydrotropic dendrimer, and hydrotropic polymer micelle. They can effectively increase the solubility of poorly soluble drugs by several orders of magnitude. The monomeric units of those hydrotropic polymers were designed based on the molecular structures of low molecular weight hydrotropic agents (or hydrotropes) which are highly effective in solubilizing poorly soluble drugs. Hydrotropic polymer micelle systems based on the hydrotropic polymers and dendrimers have been also developed and they can act as nanocarriers for poorly water soluble drugs.

In this presentation hydrotropic polymer systems based on hydrotropic structures that are effective for solubilizing paclitaxel will be introduced.