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## A novel supramolecular smart hydrogel drug delivery system

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A clear and transparent single phase reversely thermo-reversible hydrogel was developed through *in situ* supramolecular self-assembly chemistry between Poloxamer 407 and at least one water insoluble associative gelling adjuvant. The obtained hydrogel has a wide range of adjustable sol-gel transition temperature from about 4-40°C with low solid content. The specific inter-molecular interactions of self-assembly between water soluble block copolymer Poloxamer 407 and the water insoluble associative gelling adjuvant result in the formation of water soluble inter-molecular complexes. The hydrogel has enhanced ability in solubilizing and stabilizing water insoluble or sparsely soluble drugs without using other solvents. It also has the ability in dispersing or suspending and/or stabilizing otherwise insoluble drugs in the hydrogel. The enhanced solubility and stability of insoluble drugs in the hydrogel is largely attributed to the presence of supramolecular complexes formed between Poloxamer 407 and the water insoluble associative gelling adjuvant. The gelling adjuvant not only greatly enhances Poloxamer 407 gelling efficiency in water with a wide range of sol-gel transition temperature, but also increases the solubility of water insoluble or sparsely soluble drugs.

The hydrogel delivery system has demonstrated excellent skin adhesion and penetration with good safety profile for use in pharmaceutical and consumer care products with fast formulation deployment & regulatory compliance. Results of two drug products with active pharmaceutical ingredients terbinafine hydrochloride and salicylic acid for dermatological application will be discussed, respectively.

### Biography

Shao Xiang Lu has completed his Ph.D. from Polytechnic University and postdoctoral studies from Herman F. Mark Polymer Research Institute at Polytechnic University. He had held various research and management positions at Revlon, Croda USA, L'Oréal USA, and L'Oréal China. He is the founder and president of Broda International, LLC and Broda Technologies Co., Ltd. He has published more than 20 scientific publications in reputed journals and has more than 50 US granted patents and patent publications.

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