**Colloidal Dispersions of Drug Nanoparticles Obtained from Drug/Polymer/Surfactant Ternary Solid Dispersions**

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**Background and aims.** Colloidal dispersions obtained from solid dispersion (SD) have attracted much attention for improving drug solubility and oral absorption of poorly water-soluble drugs. Based on the molecular-level evaluation, the present study reports the formation and stabilization mechanism of colloidal dispersions obtained from drug/polymer/surfactant ternary SDs.

**Methods.** The ternary SDs were prepared by hot-melt extrusion, spray-drying, and co-grinding. The molecular states of ternary SDs and colloidal dispersions were evaluated using solid-state NMR, cryogenic transmission electron microscopy (cryo-TEM), and atomic force microscopy (AFM).

**Results.** Polymers and surfactants in ternary SDs contribute to the size reduction of drug domains, in addition to stabilizing the colloidal dispersions of drug nanoparticles. Preparation conditions, the polymer and surfactant species, and the weight ratio of ternary components are essential to obtain colloidal dispersions of small and stable drug nanoparticles, because they significantly affect the molecular states of the drug in ternary SDs.

**Conclusion.** The revealed formation and stabilization mechanism of colloidal dispersions will help to design ternary SDs of poorly water-soluble drugs.

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