GS01-2 **Enhanced absorption of hydrophobic drug using ternary co-ground nanoparticles**

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Recently, preparation of nanoparticles of poorly water-soluble drugs has attracted attention as a method to improve the oral bioavailability because the size reduction contributes to the rapid dissolution. Among the preparation methods, dry grinding is a solvent free and comparatively simple preparation process. We have demonstrated nanoparticle formation of poorly water-soluble drugs by the ternary co-grinding with water soluble polymer and surfactant. The mean particle size depended on composition of drug/polymer/surfactant. In this study, effect of the molecular weight of polyvinylpyrrolidone (PVP) on probucol nanoparticle formation and the oral absorption was investigated. From the results of particle size measurement, the smaller molecular weight PVP yielded comparatively smaller probucol nanoparticles. ^{13}C solid-state NMR study revealed intermolecular interactions between probucol-PVP and PVP-SDS which played an important role in drug nanoparticle formation. The oral absorption study of probucol nanoparticles in rats showed that nanoparticles of probucol/PVP K12/SDS co-ground mixture (*ca.* 28 nm) significantly improved the absorption of drug up to 40 times compared to unprocessed probucol. Results of liquid-state AFM showed that there was a layer of PVP-SDS complex covering on the surface of probucol nanoparticles prepared with PVP K17, while this layer structure was not could not be observed in those prepared with PVP K12. We speculated that the difference in surface morphology of probucol nanoparticles prepared with PVP K12 and PVP K17 affected the absorption of probucol.