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A Novel of Cocrystalization to Improve Solubility and Dissolution rate of Simvastatin

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Abstract : Simvastatin (SV) is the drug of choice for hypercholesterolemia, which belong to the BCS class II as very troubled with drug solubility. We report the novelty of increased solubility and dissolution rate of simvastatin with cocrystallization methods, using Malic acid (MA) as coformer with molar ratios (1:1). Simulation modeling of molecules against MA and SV has performed with in silico using auto dock 4.2. Synthesis of cocrystal has done with Liquid-Assisted Grinding (LAG). Cocrystal formed subsequently confirmed by tests of saturated solubility, invitro dissolution, Scanning electron microscope (SEM), Powder X-ray Diffraction (PXRD), Fourier Transformations Infrared Spectrophotometry (FTIR), and Differential Scanning Calorimetry (DSC). Insilico evaluation against the interactions between the MA and SV has demonstrated the existence of hydrogen bonding interactions. Tests of saturated solubility and invitro dissolution of Cocrystal SV: MA (1:1) was indicating an increase in the solubility and dissolution rate of the better as a result of the formation of cocrystal SV: MA (1:1). All characterization against cocrystal SV: MA (1:1) has indicated the formation of a new solid crystalline phase, which differs with SV, MA, and physical mixtures (SV: MA). Cocrystalization has can be used as a method to improve the solubility and dissolution rate of SV.

Keywords : cocrystallization, Simvastatin, Solubility, dissolution.

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