Investigating weak Interactions in Pharmaceutical Co-crystal Systems

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Pharmaceutical co-crystallisation is emerging as a possible alternative to polymorphs, salts and solvates in the modification of an active pharmaceutical ingredient (API) during dosage form. It may alter the physico-chemical properties of the API (e.g. melting point and solubility), and also have intellectual property implications.

Traditionally, co-crystallisation research has involved robust synthons with strong interactions and rarely involved pharmaceutically acceptable co-crystallising agents and conditions. Our current work has focused on the co-crystallisation of sulfathiazole with sugar excipients, [1], where moderate to weak interactions were expected to dominate.

Co-crystallisation was investigated by solution and solid-state methods (including solvent mediated grinding). Co-crystallisation of sulfathiazole with lactose, mannitol and sorbitol was unsuccessful from solution or the solid-state. However, sulfathiazole-glucose co-crystals were produced from ethanol and propanol solutions.

[1] Gavan P.T., Blagden N., Seaton C.C., Grimsey, I.M., Marshall, P., *CrystEngComm.* , 2005, *submitted*.

Keywords: co-crystals, weak interactions, pharmaceuticals