[J. Soc. Powder Technol., Japan, 33, 559-563 (1996)] [Lab. of Pharm. Engineering]

The Design of Inhalation Dry Powders by the Surface Modification of Drug Particles.

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A method for particle design to prepare a dry powder for inhalation was newly developed by the surface modification of poorly inhaled hydrophobic cohesive drug particles, e.g., pranlukast hydrate (PH, D_{50} = 2.1 μm) with hydrophilic submicronized particles, e.g., colloidal silica (D_{50} = 16 nm) and hydroxypropylmethycellulose phthalate (HP-55) nanospheres (D_{50}=51.6 nm) prepared by the authors. The surface modification was carried out by compounding the drug and additive particles under shear with a manually operating mortar, the particle designing equipment (a Theta composer), and by freeze drying the dispersion of the drug and additives.

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Enteral Absorption of Insulin in Rats from Mucoadhesive Chitosan-Coated Liposomes.

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The mucoadhesiveness of polymer-coated liposomes was evaluated to develop a novel drug carrier system for oral administration of poorly absorbed drugs such as peptides. The chitosan(CS)-coated liposomes showed the highest mucoadhesiveness and the degree of adhesion was dependent on the amount of CS on the surface of the liposomes. The blood glucose level of rats was found to be significantly decreased after administration of the CS-coated liposomes containing insulin. The lowered glucose level was maintained for more than 12h after administration of the liposomal insulin, which suggested mucoadhesion of the CS-coated liposomes in the intestinal tract of the rats.

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Novel preparation of free flowing spherically granulated dibasic calcium phosphate anhydrous for tabletting.

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Free flowing spherically granulated dibasic calcium phosphate anhydrous (DCPA) for direct tabletting was prepared by a restricted crystal growing synthesis of DCPA, followed by spray drying of its aqueous dispersions. The spherically granulated DCPA had larger specific surface area , because they had porous structures composed of very fine primary crystals compared to conventionally prepared DCPA. The crystallinity of granulated DCPA was lower than that of conventional DCPA. Those micromeritic characteristics of granulated DCPA might correlate closely with their dramatically improved tablettability.