

Thesis Title The Development of Sustained Release
Ketoprofen Solid Dispersion and
in Vivo Evaluation

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ABSTRACT

Sustained release solid dispersions were investigated using Eudragit S100, L100, RSPO, and RLPO as carriers and ketoprofen as a model drug. The physicochemical properties of prepared solid dispersion have been determined by scanning electron microscope (SEM), differential scanning calorimetry (DSC), X-ray diffraction and infra-red (IR) spectroscopy. The higher ratio of all types of carriers, the more amorphous form and ketoprofen in solid dispersion had physical change not chemical change. The different types and concentration of carriers as well as the particle size of solid dispersion were found to

influence the release rate of dosage form. The higher ratio of carries as well as the bigger size of solid dispersion particles, the less release rate of ketoprofen. Eudragit RSPO and RLPO could retard the release rate over the period of 12 hours. The kinetics of drug release was determined and appeared to conform to Higuchi pattern. To predict desired blood concentration of ketoprofen by computer simulation, the simulated plasma profiles obtained suggested that the k_H value should be within the range 25-30 $\text{mg/hr}^{\frac{1}{2}}$. Solid dispersion of 2:1:1 ketoprofen-Eudragit RSPO-Eudragit RLPO with mesh size of 20-40 provided $k_H = 27.2972 \text{ mg/hr}^{\frac{1}{2}}$, which was right at the middle of the predicted range (25-30 $\text{mg/hr}^{\frac{1}{2}}$). This profile should be potential candidates to be evaluated for in vivo studied. The in vivo investigation of the selected ketoprofen solid dispersion and commercial product were determined using a single dose of 100 mg of ketoprofen in a randomized crossover design in ten healthy male volunteers. Plasma ketoprofen concentrations were determined via HPLC technique. The results showed no statistically significant difference ($P > 0.05$) for C_{max} values, except t_{max} of commercial product was significant longer than that from the selected ketoprofen solid dispersion. Ketoprofen solid dispersion is bioequivalence to Oruvail^R capsule.