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# Poly (2-ethyl-2-oxazoline) as an alternative to poly (vinylpyrrolidone) in solid dispersions for solubility and dissolution rate enhancement of drugs

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Poly (2-ethyl-2-oxazoline) (PEOX), a biocompatible polymer considered as pseudo polypeptide, was introduced as a potential alternative to the commonly used polymer, poly (vinylpyrrolidone) (PVP) for the preparation of solid dispersion with a poorly soluble drug. Glipizide (GPZ), a BCS class II model drug, was selected for solubility and dissolution rate study. GPZ-polymer solid dispersions and physical mixtures were characterized and investigated by X-Ray diffractometry; differential scanning calorimetry, scanning electron microscopy, and Fourier transform infrared spectroscopy. The impact of polymers on crystal nucleation kinetics was studied and PEOX exhibited strong inhibitory effect compared to PVP. Solubility and dissolution behaviour of the prepared solid dispersions and their physical blends were *in-vitro* examined and evaluated. A significant enhancement in glipizide solubility was obtained with PEOX compared to the pure drug and solid dispersion with PVP. A big improvement in the intrinsic dissolution rate (45 times) and dissolved amount of glipizide (58 times) was achieved with PEOX in FaSSIF (fasted state simulated intestinal fluid), against comparable enhancement observed with PEOX and PVP in phosphate buffer at pH 6.8. Lower molecular weight of PEOX-5K (5,000 g/mol) was found to be superior to higher molecular weight PEOX-50K (50,000 g/mol) in the improvement of dissolution behaviour. The findings of this study with glipizide as a model drug introduce lower molecular weight PEOX as a promising polymeric carrier toward better oral bioavailability of poorly soluble drugs.

## Biography

Hanan Fael has her expertise in enhancing the bioavailability of poorly soluble drugs. She has worked on drug cocrystals at Barcelona University as an approach to enhance the solubility and dissolution of poorly soluble antibiotics. At the Koç University, her research focused on solid dispersion formation of drug with polymers as alternative technique to enhance the solubility and dissolution of a poorly soluble anti-diabetic drug. She has years of experience in Research and Teaching at Aleppo University and other educational institutes in Syria.

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