Efavirenz’s solubility enhancement by amorphous solid dispersions

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Introduction and objective: Efavirenz is a High Activity Antiretroviral Therapy (HIV-1 infection treatment) component. It belongs to BCS’ Class II, and it shows strong permeability and low solubility (less than 10µg/mL). In this study, solid dispersions SD was obtained by the solvent evaporation method, aimed to enhance its solubility through amorphization.

Materials and methods: SD drug: the carrier (poloxamers 188 and 407) used in a proportion of 1:3 was prepared on a rotary evaporator under a reduced pressure of 40ºC. The samples were assessed by X-Ray Powder Diffraction (XRPD) and the equilibrium solubility method (shake-flask technique). Quantities of SD were added in each media buffers pH 1.2, 4.5 and 6.8 until it reached saturation, and shaken at 150rpm for 72 hours at 37°C.

Results and conclusion: Results have shown that poloxamer 188 and poloxamer 407 were unable to promote complete amorphization of SD by XRPD. However, those same carriers were able to stabilize the binary mixture and significantly increase efavirenz solubility for over two thousand times.

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Effect of Allium sativum L. germinated bulb on wound healing skin in wistar rats

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Introduction and objective: Garlic (Allium sativum L.) is one of the most important bulb crop grown in the world. It is rich in allicin, closely related to vascular endothelial growth factor and angiogenesis in the skin. The purpose of this study was to evaluate the effect of germinated bulb garlic extracts on the wound healing skin.

Materials and methods: Germinated garlic bulb alcoholic extract at 10% (w/w) carried in emulsion (EE) compared to placebo in an emulsion (PE) in male Wistar Rattus norvegicus. Two parallel incisions were made on the right (EE) and left (PE) sides of rat’s back and the tissues were prepared for histological and morphometrical analysis (3rd, 7th, and 14th day) after the beginning of the assay.

Results and conclusion: After three days, the surrounding wounds showed fibrinous crust, new blood vessels (bv), and a large amount of inflammatory cells, but there was no difference in the treatments. Both treated lesions decreased inflammatory infiltration, granulated tissue, and fibroblastic proliferation after seven days. On the 14th day, both areas showed a reduction of bv, fibroblasts, and a large amount of collagen fibers in the extracellular matrix of connective tissue. In EE treated area, there was a better organization of matrix fibers, extracellular, and thicker collagen fibers. The repairing process was faster when compared to the PE treated area. Thus, it is possible to conclude that germinated garlic bulb alcoholic extract improves the wound healing skin in rats.