

Study and Development of Formulations Based on Microemulsion for the Delivery of Ampicillin †

Micaela Ponce Ponte ¹, Carolina Aloisio ², Marcela Longhi ^{1,*}

¹ Unidad de Investigación y Desarrollo en Tecnología Farmacéutica (UNITEFA), CONICET and Departamento de Ciencias Farmacéuticas, Facultad de Ciencias Químicas, Universidad Nacional de Córdoba. Ciudad Universitaria, 5000-Córdoba, Argentina; mponceponte@unc.edu.ar (M.P.P.)

² Unidad de Investigación y Desarrollo en Tecnología Farmacéutica (UNITEFA), CONICET and Facultad Departamento de Ingeniería Química, Facultad Regional de San Francisco, Universidad Tecnológica Nacional, 2400- San Francisco, Córdoba, Argentina; caloisio@unc.edu.ar (C.A.)

* Correspondence: mrlonghi@unc.edu.ar (M.L.);

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Abstract: Ampicillin (AMP) is one of the first-line semisynthetic penicillin due to its broad spectrum and efficacy against gram-positive and gram-negative bacteria. In Biopharmaceutical Classification System (BCS), AMP is categorized as Class III based on the high solubility and low permeability of the highest dose. The purpose of this study was to improve the permeability of AMP by developing an oil-in-water microemulsion. Pseudo ternary phase diagrams were constructed to identify the proper compositions to form microemulsions (ME). Polysorbate 80:Polyethylene glycol 400 and Polysorbate 80:Triton X-100 mixtures were selected as Surfactants, ginger and eucalyptus oils constituted the oil phase, and water was used as the aqueous phase. The droplet sizes of the internal phase of the ME were measured using Dynamic Light Scattering. Besides, the ME was also characterized by conductivity determination. Later, the amount of AMP incorporated into the systems was measured using HPLC. The formulation that presented the highest amount of AMP incorporated (22.21 mg/ml) consisted of 7% polysorbate 80, 7% TritonX-100, 6% eucalyptus oil, and 80% water. These results represent a system that can improve the efficacy of AMP administered orally.

Keywords: microemulsion; permeability; ampicillin; eucalyptus and ginger oils; non-ionic surfactants.

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Conflicts of Interest

The authors declare no conflict of interest.