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Metronidazole release using Natural Rubber Latex as matrix

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Abstract – Natural Rubber Latex (NRL) can be used successfully in controlled release drug delivery due to their excellent matrix forming properties. A dermatological delivery system comprising a topically acceptable, inert support impregnated with a metronidazole (MET) solution was developed. MET was incorporated into the NRL, by mixing it in solution for in vitro protein delivery experiments. SEM microscopy analysis showed that the number, size and distribution of pores in NRL membranes varied depending on polymerization temperature, as well as its overall morphology. Results demonstrated that the best drug-delivery system was the membrane polymerized at -100ºC, which does release 71% of its MET content for up 350 hours

Natural Rubber Latex (NRL) can be used successfully in controlled release drug delivery due to their excellent matrix forming properties. Recently, NRL has shown to stimulate angiogenesis, cellular adhesion and the formation of extracellular matrix, promoting the replacement and regeneration of tissue [1-3]. A dermatological delivery system comprising a topically acceptable, inert support impregnated with a metronidazole (MET) solution was developed. MET 2-(2- methyl- 5-nitro- 1H- imidazol- 1-yl) ethanol, has been widely used for the treatment of protozoa and anaerobic bacterial infections. MET is clinically effective in trichomoniasis, amebias, and giardiasis, as well as in a variety of infectious caused by obligate, anaerobic, bacteria, including Bacteroides fragilis [4]. In a previous study, we have tested NRL as an occlusive membrane for Guided Bone Regeneration (GBR) with promising results. One possible way to decrease the inflammatory process, we incorporated the MET in NRL. MET was incorporated into the NRL, by mixing it in solution for in vitro protein delivery experiments. The solutions of latex and MET were polymerized at different temperatures, from -100ºC to 40ºC, in order to control the membrane morphology. These membranes were characterized by Scanning Electron Microscopy (SEM), as well as the UV-VIS method to measure the MET release. SEM microscopy analysis showed that the number, size and distribution of pores in NRL membranes varied depending on polymerization temperature, as well as its overall morphology. Results demonstrated that the best drug-delivery system was the membrane polymerized at -100ºC, which does release 71% of its MET content for up 350 hours.

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