

Synthesis of articaine-loaded PLGA nanofiber by an electrospinning process

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Poly(lactic-co-glycolic) acid (PLGA) is one of the most successfully developed biodegradable polymers. Articaine is the most widely used local anesthetic in contemporary dentistry. In this study, PLGA and articaine-loaded PLGA nanofiber were prepared by using electrospinning process. PLGA and articaine were dissolved in a solvent (Tetrahydrofuran(THF):Dimethyl formamide(DMF)=3:1) and high voltage is applied to the liquid to produce charged liquid jet. The jet is elongated by electrostatic repulsion which leads to the formation of nanofibers. Nanofibers were prepared with needle size, applied voltage, and solvent flow of 23G, 23kV, 1.5ml/h, respectively. The surface morphology of the fibers were characterized by scanning electron microscopy (SEM). The PLGA/articaine nanofiber had both smooth and rough surface with an average diameter of $670\pm 30\text{nm}$. The release rate of articaine was also investigated by using an UV/Vis. spectrometer.