

# **Effects of alginate coated on PLGA microspheres for delivery tetracycline hydrochloride to periodontal pocket**

劉得任

Der-Zen Liu;Weng-Pin Chen;Chiao-Pin Lee;Su-Lin Wu;Ya-Chi Wang

## **Abstract**

The effects of alginate coated on tetracycline (Tc) loaded poly (D, L-lactic-co-glycolic acid) (PLGA) microspheres fabricated by double emulsion solvent evaporation technique for local delivery to periodontal pocket were investigated. Alginate coated PLGA microspheres showed smoother surface but enlarged their particle sizes compared with those of uncoated ones. In addition, alginate coated microspheres enhanced Tc encapsulation efficiency (E.E.) from 11.5 +/- 0.5% of uncoated ones to 17.9 +/- 0.5%. Moreover, all of the coated PLGA microspheres even fabricated at different conditions could prolong Tc release from 9-12 days with 50% or higher in cumulative release of Tc compared with those of uncoated ones. The swelling ratios of PLGA microspheres for alginate coated or uncoated ones, one of the possible mechanisms for enhancing Tc release for the coated ones, were measured. The results showed that 20% or higher in swelling ratio for the coated microspheres at the earlier stage of hydration (e.g. < or = 24 h) could be an important factor to result in high Tc release compared to the uncoated ones. In conclusion, alginate coated Tc loaded PLGA microspheres could enhance Tc delivery to periodontal pocket by enhancing drug encapsulated efficiency, released quantities and sustained release period compared with uncoated ones.