**ABSTRACT**

Tuberculosis is a prominent global health concern. New treatments are needed to overcome problems associated with drug resistance, treatment length, and patient adherence. Nanoparticles can reduce side effects associated with systemic drug distribution and improve intracellular drug concentrations. Rifampin loaded poly(lactic-co-glycolic acid) (PLGA) nanoparticles were synthesized by a water-oil emulsion technique and stirred overnight to remove the oil phase. Release of rifampin from nanoparticles was measured using a dialysis membrane and continuously monitored using a flow cell equipped spectrophotometer. Increasing the PLGA concentration increased nanoparticle size and encapsulation efficiency. Decreasing the volume of the second phase water had little effect on size, but increased encapsulation efficiency. Cellular uptake of nanoparticles by macrophages occurred within 24 h. This research aimed to further our understanding of the most effective way to fabricate rifampin loaded PLGA nanoparticles.

**METHODS**

**MATERIALS**

- Rifampin is a first-line TB therapeutic.
- Poly(lactic-co-glycolic acid) (PLGA) is a biocompatible and biodegradable FDA approved polymer. PLGA forms the hydrophobic core of the NP. PLGA is anionic at physiologic pH.
- Chitosan (CS) is a linear polysaccharide not associated with seafood allergies. Chitosan forms the hydrophilic shell of the NP. Chitosan is cationic at physiologic pH.

**RESULTS**

**RESULTS (cont’d)**

**DISCUSSION**

- Rifampin is a first-line TB therapeutic.
- Poly(lactic-co-glycolic acid) (PLGA) is a biocompatible and biodegradable FDA approved polymer. PLGA forms the hydrophobic core of the NP. PLGA is anionic at physiologic pH.
- Chitosan (CS) is a linear polysaccharide not associated with seafood allergies. Chitosan forms the hydrophilic shell of the NP. Chitosan is cationic at physiologic pH.

**HYPOTHESES**

- Rifampin is a first-line TB therapeutic.
- Poly(lactic-co-glycolic acid) (PLGA) is a biocompatible and biodegradable FDA approved polymer. PLGA forms the hydrophobic core of the NP. PLGA is anionic at physiologic pH.
- Chitosan (CS) is a linear polysaccharide not associated with seafood allergies. Chitosan forms the hydrophilic shell of the NP. Chitosan is cationic at physiologic pH.

**REFERENCES**


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