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MICROPARTICLES PRODUCTION FOR DRUG DELIVERY USING GLASS MICROFLUIDIC DEVICES

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1. Introduction
- The production of uniform microparticles from microdroplets by emulsification of different organic phase solutions has been achieved via 3D flow focusing in microfluidic glass capillary devices (Chu et al., 2007; Vladisavljevic et al., 2014).
- The size and morphology of produced microparticles of biodegradable poly(lactic acid) (PLA) and poly(lactic-co-glycolic) acid (PLGA) particles were varied and modified (with nanoclay or a non-solvent) to ascertain their effect on drug release.

2. Methodology
- Properties (microstructural and drug release) of monodispersed biodegradable polymer microparticles (PLA/PLGA) produced via microfluidic devices were shown to be dependent on dispersed phase formulation, device orifice size, phase flow rates, polymer concentration in organic solvent, and orifice size.

3. Droplet Generation
- Monodispersed PLGA particles
- Micro cross-sections of PLA/Nanoclay; Golf-like particles
- 1% PLA, 10% PLA

4. Results
- a) Particle-Droplet Diameter Relationship
- b) Encapsulated Drug Release from nanoclay embedded microparticles
- c) Encapsulated Drug Release from golf ball-like microparticles
- d) Monodispersed PLGA particles
- e) Monodispersed PLA particles

5. Conclusion
- Properties (microstructural and drug release) of monodispersed biodegradable polymer microparticles (PLA/PLGA) produced via microfluidic devices were shown to be dependent on dispersed phase formulation, device orifice size, phase flow rates, polymer concentration in organic solvent, and orifice size.

References