Preparation of Quercetin dihydrate drug formulation by ISNP Nanotechnology

Abstract

PURPOSE: The goal of this study was to explore in-situ self-assembly nanotechnology to formulate Quercetin dihydrate(QT). QT is a flavonoid antioxidant that can be found in plant foods. This drug is poorly-water soluble but can be used in different ways such as cancer treatments, lowering inflammation, fighting allergies, ect. In-situ self-assembly nanoparticles (ISNP) will not only solve the stability problem of nanoparticles because they do not form until entering the body, but it would also have the means of improving drug solubility of QT. These ISNPs are prepared by biodegradable and biocompatible lipids and surfactants, which could be used for direct injection.

METHODS/MATERIALS: QT, oleic acid and TPGS were mixed at 50°C for 10 min to form drug-loaded Pro-NPs. After reconstituted with water, QT-loaded ISNPs were formed. Several different procedures were explored to obtain reproducible results. Particle size and size distribution were measured by a DelsaNano HC Particle analyzer.

RESULTS: The nanoparticles were consistent in size and distribution therefore the first stage of this project has been completed. The mean polydispersity index was 0.287, mean diameter was 187.5nm, and mean distribution was between 79.7-575.7nm.

CONCLUSION: The QT nanoparticles were successfully produced with a consistent size and distribution for possible injection.