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The use of elastin-like polypeptides as a drug carrier material: A compatibility study

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Abstract

Stimuli responsive self-assembling nanoparticles of elastin-like polypeptides are promising platforms for targeted drug delivery and release. These particles spontaneously assemble from elastin-like polypeptide building blocks in solution. The nanoparticles stably self-assemble under specific temperature, salt, and pH conditions and can dissociate upon changing of these conditions. With appropriate design, the surface of the particles can be decorated with labels that cause them to accumulate in specific diseased tissues. In addition, the size of the particles is appropriate to minimize undesirable rapid clearance from the body. In this study, we are testing the ability of the elastin-like polypeptide core to store and release drugs and model drugs with differing chemical properties. Three chemotherapeutic compounds were loaded into the core of the nanoparticles and the release profile of the drug was determined under conditions that disrupt the particle. This release was compared to baseline release profile of the drug. This study is important in establishing the ability of ELP based nanoparticles to act as triggered drug release vehicles.