

Abstract Submitted
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Implantable Drug Delivery Using Polycaprolactone with Thermally Triggerable Release¹ JOSEPH FARINA², MAKARAND PARANJAPE, DANIEL O'BRIEN, Department of Physics, Georgetown University — Implantable drug delivery systems offer many advantages over traditional systemic routes of delivery such as improved targeting with localized delivery, minimization of side effects, and a decreased amount of drug required to treat the disease. However, these systems also face many barriers, for example the need to remove the implant, and the potential for it to elicit an immunoresponse. Polycaprolactone (PCL) is a biodegradable polymer with a slow degradation rate and a melting point of 60C, making it a suitable choice for a meltable drug sealing layer for on-demand drug release from an implantable device that will eventually degrade in the body without need for excision. Initial findings on the thermal characteristics of thin PCL sealing layers on thin-film gold microheaters are reported here. Further, a calibration curve for the thermochromic dye, europium thenoyltrifluoroacetate (EuTTA), in PCL was generated that can be used to generate a fluorescent microthermal image map for PCL. These results both pave the way for the use of PCL films in triggered-release, implantable drug delivery systems, as well as offer new insights into the use of this fluorescent imaging technique with other novel materials.

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