

Abstract Submitted  
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**Structure and Morphology of PEO-b-PLLA Diblock Copolymer Single Crystal**<sup>1</sup> LINGYU LI, KISHORE TENNETI, CHRISTOPHER LI, Department of Materials Science and Engineering, Drexel University, Philadelphia, PA 19104 — Poly (L-lactide) (PLLA) is an important biodegradable synthetic polymer of interest for medical applications such as controlled drug delivery, resorbable sutures, medical implants, and scaffolds for tissue engineering. Combining PLLA with Poly (ethylene oxide) (PEO) to form a block copolymer PEO-b-PLLA has attracted the interests of material scientists because modifications of physical and chemical properties lead to an accelerated biodegradability. Generally, the rate of degradation strongly depends on the solid state structure of the material therefore clear understanding of crystallization behavior of PEO-b-PLLA is important. Crystallization of PEO-b-PLLA primarily depends on crystallization temperature ( $T_c$ ). Solution cast thin film crystallization method was used to obtain the PEO-b-PLLA single crystals. At temperatures above  $T_m$  of PEO and below that of PLLA, PLLA crystallizes and forms lozenge-shaped single crystal. When cooled to room temperature, PEO begins to crystallize and form fractal-like single crystal on the top of already formed PLLA crystals. However, at temperatures below  $T_m$  of PEO, only the fractal-like PEO single crystals were observed. Structure and morphology of this novel single crystal was explored using TEM and AFM.

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