PREPARATION OF OLIGO RICINOLEIC ACID DERIVATIVES VIA LIPASE-CATALYZED ESTERIFICATION AS LUBRICANT ADDITIVES AND STAR PLYMERS FOR DRUG DELIVERY

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We have employed biocatalysis using immobilized lipases under solvent-free reaction conditions to convert ricinoleic acid as a model hydroxyl fatty acid biorefinery derivative to produce derivatives of its oligomers. Covalent attachment of *oligo*(ricinoleic acid) to polyols containing primary hydroxyl groups such as pentaerythritol produces star

polymers that possess low melting point temperatures and high viscosity indices, suggesting their used in lubrication. Recently, we have investigated approaches to produce similar star polymers that would be more effective as drug delivery vehicles, to allow for a greater density of *oligo*(ricinoleic) acyl chains extending outward from the central core, and to possess functional groups on the termini of the chains, which will enable conjugation of hydrophilic groups, such as poly(ethylene glycol) and its derivatives, thereby producing a unimolecular polymeric micelle. The main approach is

to enzymatically attach 10-undecenoic acid to the termini, to incorporate a reactive terminal double bond into the resultant product. This poster will provide an overview of the different approaches used to conduct and monitor the progress of reaction, the latter of which was quite challenging.