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AMPHIPHILIC NANOCARRIER SYSTEMS FOR TARGETED DRUG DELIVERY

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Carrier systems are required for drugs having poor solubility/bioavailability. Different amphiphilic block copolymers and ABA type conjugated macromolecules have been synthesized from reneable resources using reversible addition-fragmentation chain transfer (RAFT) polymerization and the copper-catalyzed azide-alkyne cycloaddition commonly termed as "click chemistry" respectively. Extensive characterization of the biomaterials has been carried out and biomaterials were evaluated for the encapsulation and release of different drugs. The micellization, drug encapsulation and release behavior of macromolecules was investigated. The synthesized materials self-assebled into nanoparticles with different average sizes due to different ratio of hydrophilic contents in the block or conjugate backbone. The particle size and structure could be altered by changing the ratio of hydrophilic and hydrophobic contents. The *in vitro* drug encapsulations highlighted that all the drug-loaded carriers had spherical or near-spherical morphology. *In vitro* drug release studies showed the controlled release of hydrophobic drugs over a period of 70 hours. The results indicate that there is great potential of renewable lipid-based micellar nanoparticles to be used as drug delivery systems.

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