

Target Lipophilic Drug Carrier Using Oleosome for Cancer Treatment

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Until now, since numerous potent lipophilic drugs show low bioavailability, lipophilic drugs cannot be delivered by intravenous injection or oral. In this research, to overcome the limitations of the lipophilic drug delivery, the magnetic oleosome functionalized with recombinant proteins is developed as a new carrier of oil-based lipid drugs for cancer treatment. Proposed oleosome consists of neutral fats by a phospholipid single layer with embedded oleosin fusion proteins. The oleosin is genetically fused to a nanobody of a fluorescent protein (FP). The oleosome is coupled to antibody using a recombinant protein composed of immunoglobulin-binding protein LG fused to FP for delivery targeted to breast cancer cells. In addition, the lipid core of oleosome contained magnetic nanoparticles and carmustine as lipophilic drugs. Specific delivery of oleosome to target cancer cells is investigated through a confocal microscope. Also, oleosome is effective in cancer cells treatment by animal study. From result, this lipophilic drug loaded magnetic oleosome can be an effective tool for lipophilic drug delivery for cancer treatment.