

Nanoparticles versus modified plant protein as drug delivery vehicle

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Nanotechnology is the emerging technology wherein everything is at the nanometer scale. Nano drug delivery systems have improved performance due to enhanced diffusion rate and high drug loading capacity so that it can be a controlled and targeted drug carrier. Though nano drug delivery vehicle has high specificity, it is very toxic mostly to brain as it may cross the blood brain barrier and can be easily recognized by white blood cells and hence cleared from circulation. To overcome this disadvantage, proteins from plants can be used as drug delivery carriers. Plant proteins are biocompatible and non-toxic. Modified plant proteins called oleosins from sunflower seeds tend to be biocompatible carriers for drug delivery. Proteins are genetically engineered to make a variety of protein molecules that assemble into vesicles for the purpose of drug delivery. Many proteins are being used as drug delivery carrier. But they have not been used as controlled drug delivery carrier. In case of recombinant proteins from sunflower seeds, they are capable of controlling the sequence of amino acids for targeting to specific receptors and other biological targets. In addition to the sunflower seeds protein being used as drug delivery carrier, they also have a protein ring sun flower trypsin Inhibitor (SFTI) which can be used in its natural form to block breast cancer enzymes. Thus plant proteins can be used as a vesicle as well as a drug for cancer treatment.

Pharmacological evaluation of omega-3-fatty acid loaded nanoemulsion formulation in atherosclerosis induced rodent model

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Atherosclerosis involves a complex interplay of inflammation, endothelial dysfunction and hyperlipidemia. In the current, epidemiological scenario a vast majority of mortality world-wide is attributable to demolition of vulnerable atherosclerotic plaques. The leading treatment options include surgery to flatten the artery-clogging plaques or divert blood around them, also the current chemotherapeutic options for disease management sloshes through the entire system and still are not up to the mark. Marine omega-3-fatty acids armored with anti-inflammatory, antihypolipidemic and antihypertensive properties are of potential use in clinical management of atherosclerosis. The main purpose of this study was to evaluate the effect of marine omega-3-fatty acid concentrate loaded nanoemulsion system in atherosclerosis induced rodent model. A total of 24 male New Zealand white rabbits of 1.5–2.0 kg of body weight were recruited and divided into 4 groups with 6 animals in each group. Atherosclerosis was induced in the animals by means of hypercholesterolemia in all 3 groups leaving aside the normal control group. The omega-3-nanoemulsion treatment led to a significant dose dependent decrease in blood triglyceride levels. Also on performing comparative analysis the bioavailability of omega-3-fatty acids concentrate formulated as nanoemulsions was found to be more as compared to omega-3-fatty acids administered as marine fish oil. Preliminary studies suggest that the omega-3-fatty acid loaded nanoemulsion system can significantly improve the serum lipid profile, also it demonstrates dominant role in lowering the level of inflammation in atherosclerotic rodent model.