

Monocyte-mediated delivery systems for theranostic applications in inflammatory-associated disorders

Gershon Golomb

Institute for Drug Research, The Hebrew University of Jerusalem, Israel

The mononuclear phagocytic system (MPS) is a part of the immune system that consists of phagocytic cells, primarily monocytes, and macrophages. Both circulating monocytes and neutrophils phagocytose debris, and foreign particles in the blood including particulate drug delivery systems. Inflammation characterizes several pathological disorders including cardiovascular disorders and cancer, and the inflammatory cascade involves significant

infiltration of phagocytic cells. The propensity of monocytes for rapid phagocytosis of particulate matter provides a rational approach for delivering drugs in inflammatory-associated disorders. In this presentation, we will review therapeutic as well as diagnostic approaches mediated via specially designed nanoparticles (NPs), which are avidly internalized by circulating monocytes. Monocytes can serve as a courier of specific NPs to the CNS, bypassing the blood-brain barrier (BBB), effectively transporting drugs that are brain-impermeable. Liposomal delivery of quantum dots (QDs) enables an efficient fluorescent signal with no toxicity, in animal models of cardiovascular and cancer disorders. In addition, we will present recent results, unpublished, on the accumulation and

retention of QDs in a mammary carcinoma model, following systemic administration, in comparison to passive delivery by the enhanced permeability and retention effect (EPR). The developed NPs delivery systems represent a novel approach for effective theranostic of inflammatory-associated disorders including cardiovascular, brain, and cancer diseases.

Biography

Gershon Golomb is a Full Professor of Pharmaceutics at the School of Pharmacy, Faculty of Medicine, The Hebrew University of Jerusalem. His works for many years has focused on drug delivery systems. His studies have developed controlled-release implantable and injectable drug/gene delivery systems; from hypothesis to *in-vivo* studies. He is an expert in targeted nanoparticles (polymeric-based and liposomes) for the treatment of cancer, cardiovascular disorders, and inflammatory-associated pathologies.

gershong@ekmd.huji.ac.il