Distinct Subcellular Trafficking Resulting from Monomeric vs Multimeric Targeting to Endothelial ICAM-1: Implications for Drug Delivery.

Title: Distinct Subcellular Trafficking Resulting from Monomeric vs Multimeric Targeting to Endothelial ICAM-1: Implications for Drug Delivery.

Publication Type: Journal Article

Year of Publication: 2014

Authors: Ghaffarian, R, Muro, S

Journal: Mol Pharm

Date Published: 2014 Oct 24

ISSN: 1543-8392

Abstract: <p>Ligand-targeted, receptor-mediated endocytosis is commonly exploited for intracellular drug delivery. However, the influence of multimeric versus monomeric ligand presentation on trafficking itineraries has not been extensively characterized. Here, we investigate the comparative subcellular trafficking of these two ligand-presentation states to endothelial ICAM-1 (ICAM-1). Monomer targeted to ICAM-1 traffics via lipid raft domains of the cell membrane, while multimeric targeting utilizes vesicular endocytic pathways. We propose a model for these trafficking differences, consisting of increased multimeric avidity, multivalent interactions, and higher ligand concentration. Understanding these differences has potential implications for drug delivery, particularly for targeting to ICAM-1 in vivo. This novel model provides new insight into this biological pathway and alternative avenues for drug delivery.</p>

DOI: 10.1021/mp500409y

Alternate Journal: Mol. Pharm.

PubMed ID: 25301142