

Last Name (print): _____ First Name (print): _____

WORKSHOP 7 - YCL

Ultrasound-Enhanced Drug Delivery, February 25, 2014

Cartoon below illustrating one of CU-ME studies on ultrasound-mediated delivery with plasmid DNA transfection to tumor cells in vivo using polyplex-microbubbles. (1–2) Polyplex-microbubbles enter the tumor vasculature after being introduced systemically. (3) Ultrasound applied to the tumor region causes inertial cavitation and microbubble fragmentation, resulting in polyplex/lipid release and permeation of the endothelial lining, allowing the DNA vector to extravasate into tumor tissue. (4) Polyplex/lipid vector entry into a tumor cell. Plasmid DNA dissociates from the polyethylenimine (PEI)/lipid vector and enters the nucleus of the cell where the genes can be expressed.

Please compare this approach with the nanoparticle therapeutics discussed today. Identify one advantage and one disadvantage.

