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### Echogenic liposomes for molecular targeted therapeutic delivery

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Our group has developed targeted echogenic liposomes (ELIP) that can entrap therapeutics and release them at the target site. A key therapeutic is t-PA (tissue plasminogen activator). We have demonstrated entrapment and release following ultrasound application with t-PA effect on clot dissolution. We have demonstrated that t-PA can act as a targeting agent. Thus this drug can be both a targeting agent and a lytic agent minimizing the development of complicated formulations required for targeting and lysis. We have entrapped glitazones and demonstrated release following ultrasound application with drug effect by suppressing vascular hyperplasia. We have demonstrated that ultrasound with our ELIP can enhance delivery of agents into all areas of the atheroma, including the intima, media, the loose and dense adventitia. Heretofore these regions close to the arterial media have been impenetrable using standard intravenous drug therapy.

These projects are helping to develop our echogenic immunoliposomes to; optimize targeted contrast delivery into vascular beds that are poorly penetrable by standard imaging agents; and optimize local release and concentration of therapeutics at the site of interest. This will ultimately help to direct therapeutic delivery, increase local effect, while minimizing the systemic effects of drugs and genes.