194e *in Vivo* Characterization of Microfluidic Probes for Convection Enhanced Drug Delivery

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Convection enhanced drug delivery (CED) is a promising new therapeutic method for treating diseases of the brain. In contrast to other localized drug delivery methods that rely on diffusion mediated transport, CED uses pressure gradients to distribute therapeutic agents into tissue which leads to greater penetration and uniform concentration profiles. The conventional protocol for CED treatments involves inserting a catheter into the affected tissue and delivering a known volume of solution at a constant flow rate via an external pump. Occlusion of the catheter is a common problem with this protocol, which in turn leads high infusion pressures, backflow along the outside of the catheter shaft, and ultimately the inability to control the distribution of the infused solution.

We have fabricated and characterized implantable microfluidic devices using standard micromachining techniques. Channels were characterized by delivering fluid under constant pressures of 5-30 psi which resulted in flow rates of 0.5-3 microliters/minute. Constant pressure infusions of albumin were performed in the caudate of rats at 2.5, 5, 10, and 20 psi. The volume and shape of albumin distribution was measured and compared to conventional needle/catheter infusion protocols.