

**AbstractID: 14544 Title: Ultrasound Modulation of the Blood-Brain-Barrier for Targeted Drug Delivery**

The blood-brain barrier is a primary limitation to the use of many drugs in the central nervous system. This barrier, which normally serves to protect the brain, with few exceptions limits the delivery of only small molecules from the circulation. We have found that when relatively low-intensity ultrasound bursts are combined with circulating microbubbles (commercially-available ultrasound contrast agents) that the blood-brain barrier is temporarily disrupted for a few hours with little or no other effects in the brain. The ultrasound beam can be applied transcranially, resulting in a potential noninvasive means to target drugs to the brain. To date we have demonstrated this technique in small animal models. If this technology can be translated to humans, it could provide new opportunities for the development and use of drugs in the brain.

Learning objectives:

1. Learn how ultrasound and microbubbles are applied for blood-brain barrier disruption
2. Identify histological effects of the ultrasound exposures that have been observed in animal studies
3. Learn about potential mechanisms that might be involved with the disruption
4. Learn how ultrasound can be focused into the brain transcranially and potential methods to guide the procedure.