# Effects of Propofol on Transcytosis in an IPSC Derived Blood Brain Barrier Model

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**Background:** In 2016, the FDA released a report concerning the use of anesthetics in young children and pregnant women. This report states that prolonged or repeat exposure to anesthetic may lead to neurodevelopmental delay. Previously, Canfield et al., had determined a method for developing a human blood brain barrier model from induced pluripotent stem cells (iPSC). Preliminary data has shown that exposing this model to propofol at relevant concentrations significantly reduces barrier strength and may promote leakiness of the blood brain barrier.

**Design/Methods:** Our efforts during these ten weeks focused on the effects of propofol on transcellular mechanisms in iPSC-derived brain microvasculature endothelial cells (BMEC). After exposing to propofol, fluorescently labeled dextran transcytosis and accumulation was analyzed on a fluorescent plate reader. Specifically, we monitored the transcellular movement of different molecular weighted dextrans.

**Results:** Treatment of BMECs with 50uM propofol increased transcytosis and accumulation of 10kDa dextran as compared to control. Increased transcytosis in the absence of increased accumulation of 3kDa dextran may provide evidence of paracellular transport. Transcytosis and accumulation of 40kDa dextran were unchanged between treatment and control groups. These data may provide evidence that propofol affects transcytosis mechanisms differently.

**Potential Impact:** We hope to more fully understand the mechanism by which anesthetics such as propofol effect the blood brain barrier. Due to the presence of tight junction proteins, transcytosis is an important mechanism for moving materials into the brain parenchyma. Further research will need to be done to determine the mechanism by which propofol affects BMEC transcytosis.