**Text for editing, demo edit 1, Module 1.7 (optional)**

Immortality is an alluring concept. Some scientists believe that it will be possible to "upload" one's mind by recreating the circuitry of the brain in silico. Before we can upload brains, we first must reverse-engineer neural circuitry and begin by creating a circuit map.

Ina , Dr. Kevin Briggman and colleagues (Briggman, Helmstaedter, and Denk 2011) recently mapped the connections between key neurons — starburst amacrine cells and bipolar ganglion cells — in the mouse retina. The works a long-standing

Brignmann’s team used serial block-face scanning electron microscopy (SBEM; Denk and Horstmann 2004) to visualize synapses and follow neural processes. Electron microscopic resolution is necessary to map neural circuitry. Focused ion-beam scanning electron microscopy (Knott et al. 2008) fails to process tissue pieces larger than 40 microns in diameter and transmission electron microscopy requires thin samples that often succumb to the damaging effects of manual handling and section distortion. Thus, it's most prudent to use a method that images the block-face directly and is capable of imaging large block-faces. Brigmann’s SBEM provides both necessary components.

Brigmann’s team treated a 200-micron piece of retina, including the entire arborization field of a starburst amacrine cell with an extracellular stain that could outline cells and neural processes in SBEM. Due to their many intercellular features, Brigmann’s team could not directly visualize snapses (neural connection). But, based on morphology, they inferred the locations and sizes of putative synapses. They also stained a second piece of tissue with an intercellular stain that revealed synapse-associated features ; and they correlated the synapse maps between the first and second pieces of tissue.

ADD PARAGRAPH ABOUT THE CONTROVERSY THE SOLVED!

The next steps in whole-brain circuit reconstruction will be to prepare, imagem and map the whole mouse brain using SBEM (Mikula, Binding, and Denk 2012) . This would represent the first mammalian complete connectome (Seung 2011) and would be the closest anyone has ever come to immortalizing a mammalian brain.