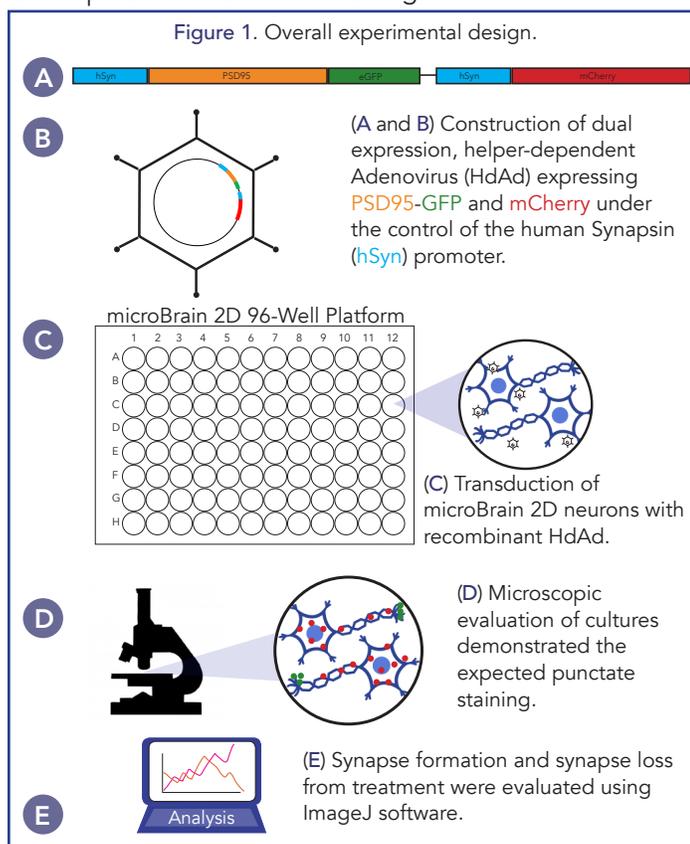


Frontiers in Cellular Neuroscience
Green et al. (17 Oct. 2019)

Synaptic loss and dendritic damage are key elements of many neurodegenerative and psychiatric diseases. In their recent paper, Green et al. (2019) developed a fluorescent imaging method (Automatic Synaptic Imaging Assay; ASIA) for measuring network synaptic density and demonstrate how the StemoniX microBrain 2D platform can be used to identify disease and drug-induced synaptic changes.

Because of its flexibility and amenability to transduction, the microBrain 2D platform is readily adaptable for assay development and disease modeling.



Synapses were readily identified and quantified in microBrain 2D cells.

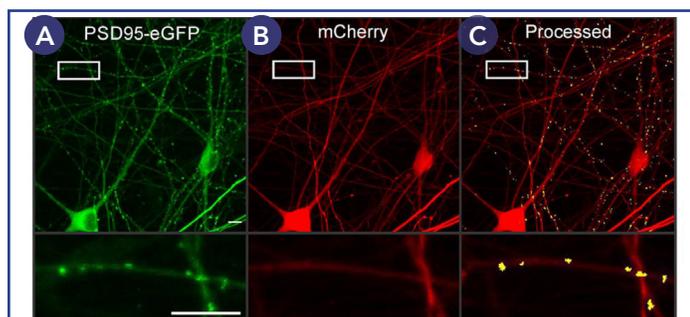


Figure 2. Confocal images of HdAd-hSyn-PSD95-eGFP-hSyn-mCherry transduced microBrain 2D (A) PSD-95-eGFP (B) mCherry, and (C) overlay. Inset shows enlargement of boxed area.

The microBrain 2D platform reliably detects drug-induced changes in synaptic number and differentiates between synapse-specific and general toxicities.

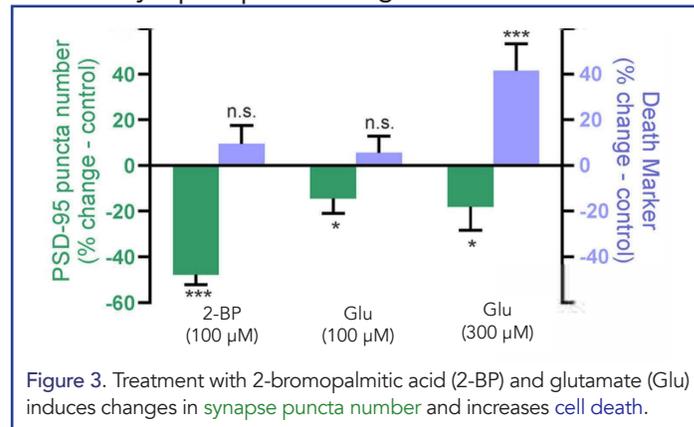


Figure 3. Treatment with 2-bromopalmitic acid (2-BP) and glutamate (Glu) induces changes in synapse puncta number and increases cell death.

microBrain 2D is also transducible with multiple AAV strains to enable experimental flexibility.

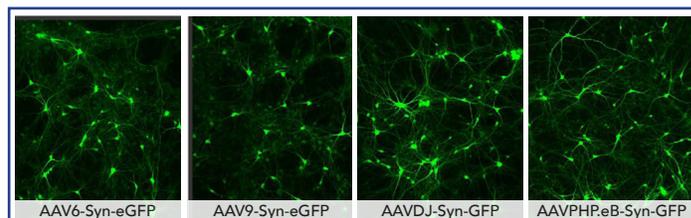


Figure 4. Transduction using AAV hSyn-GFP reporter constructs demonstrated tropism for microBrain human iPSC-derived cortical neurons across multiple serotypes.

Overall Findings

- microBrain 2D is a flexible platform that allows for viral transduction with both adeno and adeno-associated viruses.
- microBrain 2D provides an excellent platform for evaluating and quantifying human synapses with automated fluorescent imaging methods.
- microBrain 2D provides a human-based model for studying neurodegenerative/psychiatric diseases and drug-induced toxicities arising from changes in synaptic density.

For more information on this or other microBrain 2D applications, please visit StemoniX.com and contact us at info@stemonix.com