

Media Supplement for Giant Synapse Culture

Applications

- Model for identification of new neural signalling pathways
- Identification of novel neural drug targets

Problem & Solution

Understanding signaling mechanisms at single-synapse resolution is required not only for the comprehensive understanding of mechanisms in synapse development and functions but also the discovery of new drugs for psychiatric disorders. However, because of its small size, synaptic studies at single-synapse resolution is extremely difficult.

The media supplement of this technology makes it possible to form the largest synapse in the mammalian central nervous system, the calyx of Held synapse *in vitro* with *in vivo*-like morphological and physiological properties. Because of its large size, the cultured giant synapse is an ideal model system to perform the single-synapse study leading to the identification of new signaling pathways in synapse development and functions, and the identification of novel drug targets for neurological disorders.

Benefits

- Access to a single synapse that is 2000 times larger than a conventional synapse in volume
- Long-term experiments, up to 30 days for neuronal culture
- Efficient in-vitro drug screening

Patent Granted

Publications

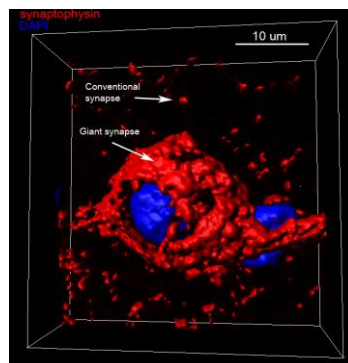
Dimitrov et al, J. Neurosci (2016) 36(12): 3600–3610, Guillaud et al, eLife 2017;6:e24845

Keywords

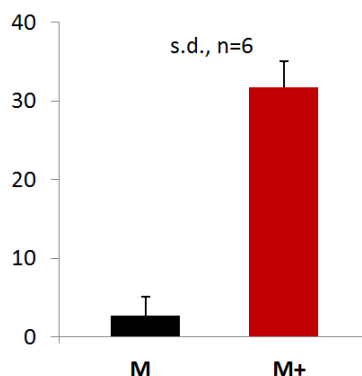
Media supplement, giant synapse, neuronal culture, electrophysiology, Parkinson's, Alzheimer's, ADHD

For more information

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<http://www.youtube.com/watch?v=VzVkJTgyi9il>



(Top) a 3 dimension confocal reconstitution image of calyx of Held synapse. Nuclei (blue) and axon (red) are depicted. (Bottom) Assessment of synaptogenic effect of standard culture medium without (M) and with (M+) the medium supplement of this technology. Vertical scale is number of giant synapses per 35 mm dish.