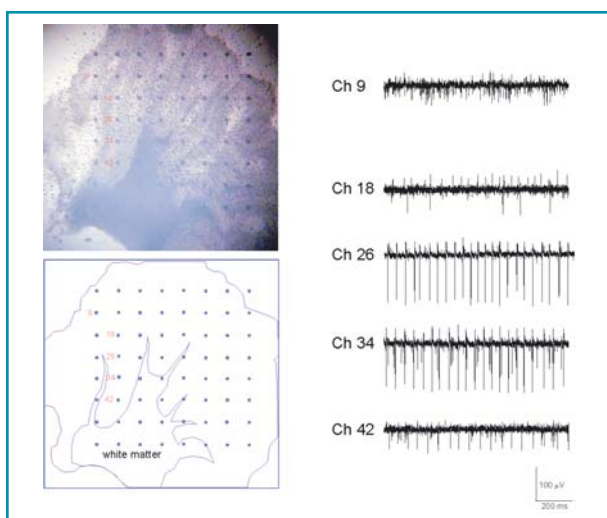
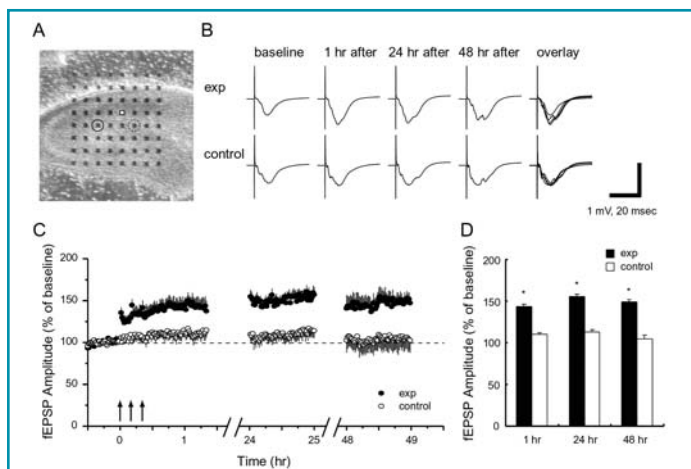


Slice Explant and Dissociated Neuron Cultures

Longevity of LTP in Cultured Hippocampal Slices

- A. Hippocampal slices cultured on the MED probe (150 μm inter-electrode spacing)
- B. Field EPSPs evoked by Schaffer/Commissural stimulation were recorded in field CA1 before and after tetanic stimulation.
- C. Summary graph showing the stability of LTP over several days. The amplitude of the fEPSP (calculated as a percentage of averaged baseline values; means \pm S.E.M., $n=8$), is shown for the control and potentiated pathways. Arrows indicate the time of tetanus stimulation.
- D. LTP amplitude was averaged over a 10 min period at 1h, 24h, and 48h after tetanus stimulation, and was expressed as percentage of baseline values.

Shimono K et al., *Neural Plasticity* 2002, 9(4) 249-254



Cerebellum

Left:

Cerebellar slice cultured on MED probe. The slice was prepared from a 10-day old rat and grown in culture for 10 d on a methylcellulose membrane, then transferred to the MED64 probe. The scheme underneath shows the gross structure and electrode arrangement.

Right:

Spontaneous activity recorded from multiple channels. The recording sites and the corresponding channels within the slice are indicated in the image on the left. The presence of spikes with large amplitude implies that an active neuron resides close to the recording electrode.

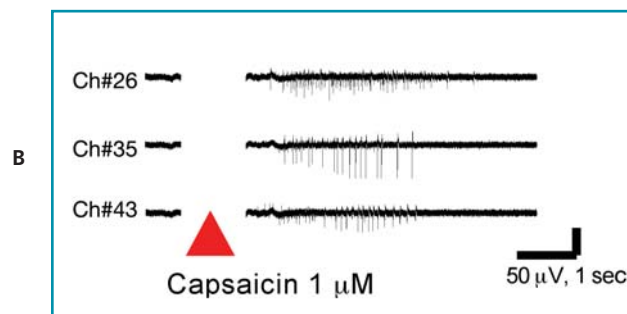
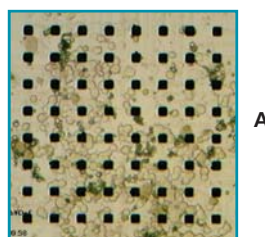
Special thanks to A. Arai at Southern Illinois University

Dissociated Neuron Cultures

Effects of Capsaicin on DRG neuron firing

- A. Rat dorsal root ganglion (DRG) neurons cultured directly on MED probe. (150 μm inter-electrode spacing; 3 days in culture)
- B. Spontaneous unit activity obtained from dissociated cultures of DRG neurons. Activity is evoked and obtained for a few seconds in the presence of 1 μM Capsaicin.

The system may not apply to all types of experiment in this field. Ask us for your specific requirements.



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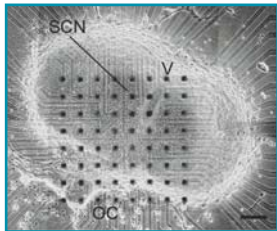
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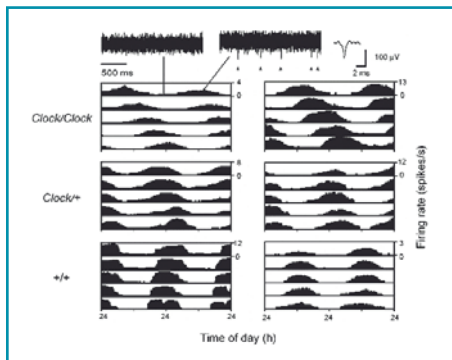
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Slice Explant and Dissociated Neuron Cultures

Culture directly on the MED probe and run long-term recording studies. Examine the short-term and long-lasting effects of drug treatments or relationships between structure and function during development.



A



B

Biological Rhythm Electrophysiology

Study circadian and other biological rhythms as the cultures grown in the probe can be tested repeatedly day and night.

Circadian Activity

A. A phase-contrast photomicrograph of a cultured SCN slice on the MED probe after 14 d in culture. (20 μm square micro-electrodes with 100 μm inter-electrode spacing)
Scale bar, 150 μm

B. Representative circadian firing rhythms of SCN neurons from Clock mutant and wild-type mice in slice cultures.

The firing rhythm was expressed in a histogram of the mean firing rate in 15 min. and double-plotted. The numbers in the right margin of the first lane in each panel were the scales of firing rate. The circadian periods of these firing rhythms were 28.1 h (left) and 28.0 h (right) for Clock/Clock, 25.3 h and 24.5 h for Clock/+, and 23.3 h and 23.8 h for +/+ neurons, respectively.

Nakamura, W. et al. Clock Mutation lengthens the circadian period without damping rhythms in individual SCN neurons. Nature Neuroscience, 5, 399-400 (2002)

Studies Using Co-Cultures

Drug Effects on Co-Cultured Slices of Septum and Hippocampus

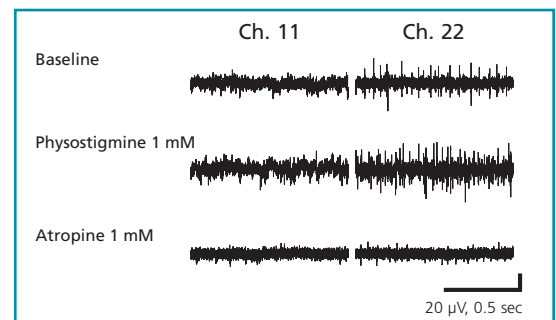
A. Septal slices (bottom part, from 5 day-old rats) were co-cultured with hippocampal slices (upper part, from 9 day-old rats) on the MED probe for 19 days (450 μm inter-electrode spacing).



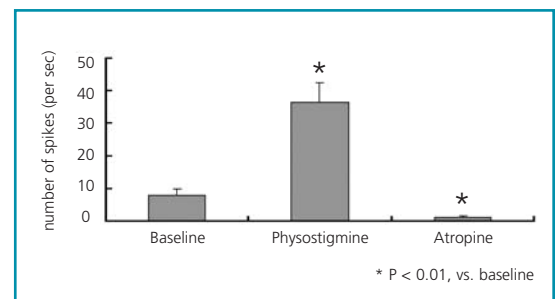
A

B. Spontaneous unit activity measured at the electrodes marked in red. Physostigmine 1 μM, a cholinesterase inhibitor, increased unit activity in both CA1 and CA3. Atropine 1 μM, a muscarinic receptor antagonist, blocked activity.

C. Quantification of the effects of Physostigmine and atropine. (means + SEM n=2). This result indicates that spontaneous activity in septo-hippocampal co-cultures is influenced by cholinergic drugs.



B



C

Data kindly provided by Tensor Biosciences

* P < 0.01, vs. baseline