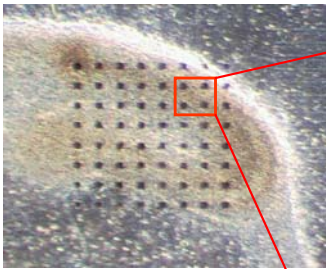


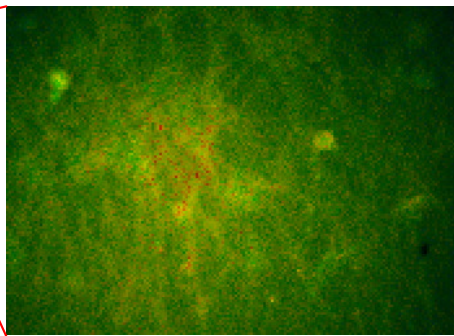
### Combining MED system with the other equipment

#### Simultaneous multi-cellular calcium imaging and multi-site electrophysiological recording

- \* Combines high magnification calcium imaging with electrophysiological stimulation and measurement using a planar electrode array
- \* Provides time resolved correlation of ionic and electrical activity in brain slices at the network level



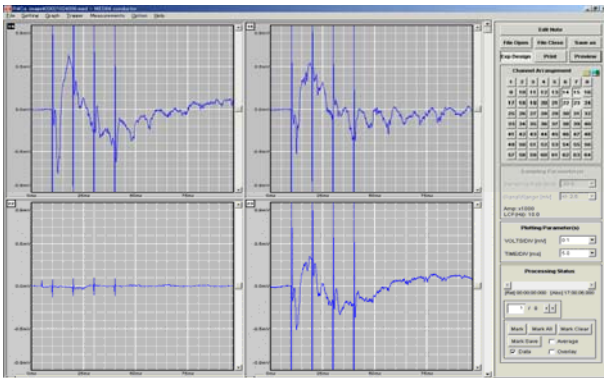
Hippocampus slice cultured on the MED probe (14 days in culture)



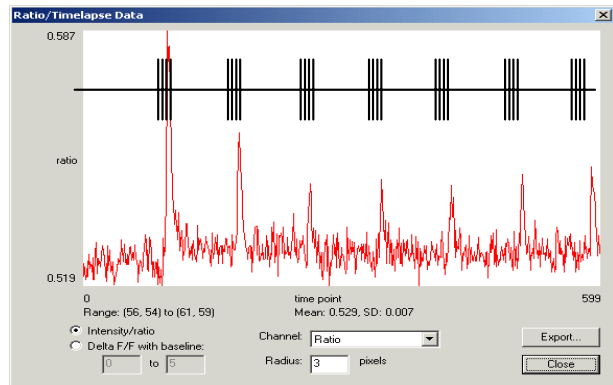
Pyramidal layer in the same slice labeled with Fura-2

#### Methods

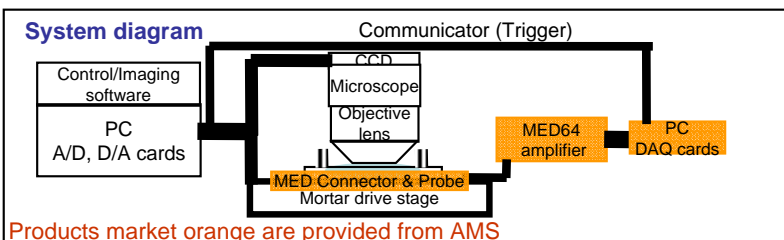
- \*Hippocampus slice culture on the MED probe was bulk loaded with fura-2 (20  $\mu$ M).
- \* Four-pulse burst stimulation was applied every 30 seconds via one of the 64 microelectrodes underneath the slice.
- \*High magnification calcium imaging with 3i digital imaging microscopy workstation and filed potential with MED64 system were recorded simultaneously.



[Left] Field potential was recorded with MED64 System at 4 sites (electrodes in the red square) in the pyramidal layer of hippocampus slice culture during the burst stimulation. The traces show the responses to a single 4-pulse stimulation.

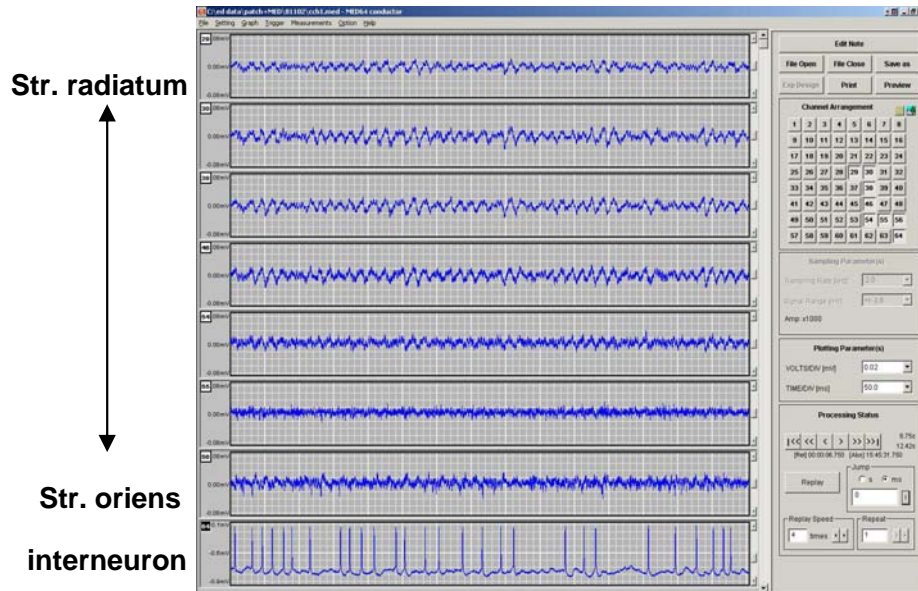


[Right] Fluorescence intensity was simultaneously measured in the same pyramidal layer (shown by the red square) of hippocampus slice culture during the burst stimulation using 3i digital microscopy workstation. The blue vertical lines at the bottom show the burst stimulations which were applied every 30 seconds. A rapid elevation of somatic calcium in the dye-loaded cell bodies was observed at the onset of each burst. By 1 second after each burst, calcium level returned to near baseline.



## Combination with Patch-clamping

- \*Simultaneous Patch Clamp and Multi-site Field Potential Recording
- \*Connects output from patch amplifier to any channel out of 64 using built-in switch board.
- \*Acquires patch-clamping data with MED64

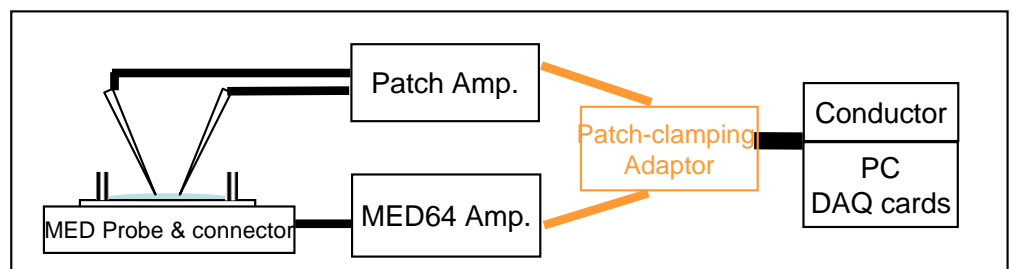


### Simultaneous patch clamp and multi-site field potential recording from rat hippocampus CA3 slice generating rhythmic activity.

The figure shows extracellular recordings from the stratum radiatum (top trace) through to the stratum oriens (2nd to bottom, showing phase reversal) of the CA3 and an intracellular recording from an interneuron from the stratum oriens.

*Courtesy of Drs. Ed Mann and Ole Paulsen at Oxford University*

### Patch-Clamping adaptor (Left) and System diagram (Right)



**[Upper Left]** Built-in switch board for connecting patch clamp output to any channel out of 64. Max. Input level:10V

**[Bottom left]** Connect MED64 amplifier and PC

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