

*made to measure*

# Juxtacellular Filling

## Extracellular, Intracellular, and Patch Recording

### ELC-03XS

Extracellular, Intracellular, and Patch Clamp Amplifier



Ref.: Daniel J., HR. Polder, V. Lessmann & T. Brigadski (2013) Single-cell juxtacellular transfection and recording technique *Pflügers Arch Eur J Physiol*, Epub ahead of print, <http://www.ncbi.nlm.nih.gov/pubmed/23748581>, <http://dx.doi.org/10.1007/s00424-013-1304-2>  
Herfst L, Burgalossi A, Haskic K, Tukker J J, Schmidt M, and Brecht M (2012) Friction-based stabilization of juxtacellular recordings in freely moving rats, *J.Neurophysiol.* 108, 697-707  
Stroh A, H. Adelsberger, A. Groh, C. Rühlmann, S. Fischer, A. Schierloh, K. Deisseroth, and A. Konnerth. (2013) Making Waves: Initiation and Propagation of Corticothalamic Ca<sup>2+</sup> Waves In Vivo *NEURON* 77, <http://dx.doi.org/10.1016/j.neuron.2013.01.031>

### BA-03X

Extracellular and Bridge Amplifier



## Features:

- ➡ Suitable for **extracellular recording** with high and low pass filters, and gain up to 1000
- ➡ Powerful current pump enables "single-cell" **electroporation** with **DNA** or **juxtacellular filling** with **dye**
- ➡ Precise, "single-cell" **stimulation** with current or voltage ( $\mu\text{A}$  range,  $\pm 15\text{ V}$ )
- ➡ Suitable for **intracellular recording** with sharp microelectrodes (ELC-03XS and BA-03X)
- ➡ Suitable for recording in the **perforated** and **whole-cell** configuration of the **patch clamp** (ELC-03XS)
- ➡ Available with differential miniature headstage for *in vivo* recording (option)



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# SEC-05X

## Intracellular and Patch Clamp Amplifier



Ref.: Böhner, F., Weiss, E. K., Birke, G., Maier, N., Schmitz, D., Rudolph, U., Frotscher, M., Traub, R. D., Both, M. & Draguhn, A. (2011). Cellular correlate of assembly formation in oscillating hippocampal networks in vitro. *PNAS*, 108, E607-E616

## Labelling neurons using npi's ELC amplifiers

### MVCS-Series



Ref: Varvel et al. :Microglial repopulation model reveals a robust homeostatic process for replacing CNS myeloid cells  
*PNAS* 2012, 109(44):18150-5. doi: 10.1073/pnas.1210150109.

Müller C & Remy S: Fast micro-iontophoresis of glutamate and GABA: a useful tool to investigate synaptic integration, initiation and propagation of corticothalamic Ca(2+) waves in vivo. *J Vis Exp*. 2013 Jul 31;(77). doi: 10.3791/50701. (incl. video on JoVE)

MVCS used for

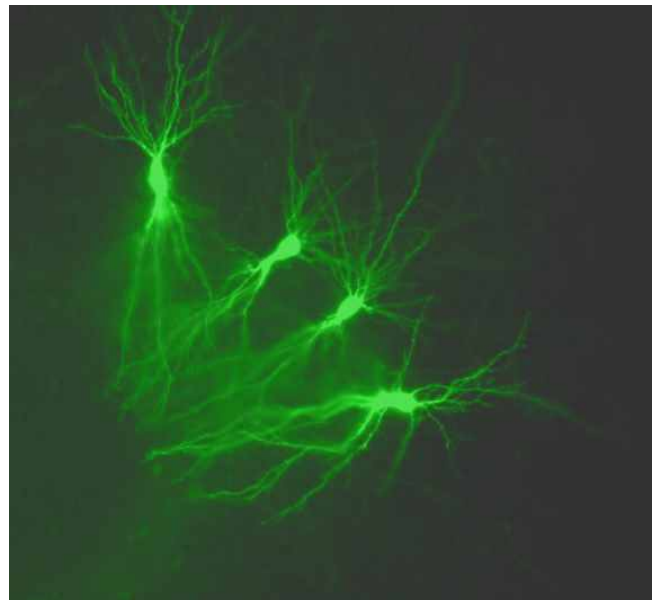
**In Vivo Labeling of Monocytes with a Calcium Indicator Dye.**

Same instrument also suitable for

**Precise Drug Application:**

pulses down to 100  $\mu$ s give spatial resolution down to 1  $\mu$ m<sup>2</sup>

➔ alternative to uncaging



CA3 pyramid neurons of the rat GFP labelled *in vitro* in cultured hippocampal slices

Picture kindly provided by Dr. Lessmann and Dr. Brigadski

Ref.: Daniel J., et al.: (2013) Single-cell juxtacellular transfection and recording technique *Pflugers Arch*  
Stan, A et al. (2010). *PNAS*, 107, 11116-11121

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