

IMPROVED PLANAR PDMS PATCH ELECTRODE ARRAY

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We have presented a planar electrode array micromolded in the silicone elastomer, poly(dimethylsiloxane) (PDMS or “Sylgard”) for use as patch clamp electrodes (Klemic, K.G., et al., *Biophys J.* 80:337a). Surface treatment of these PDMS electrodes permits gigaseal formation and “macropatch” recordings of ionic current using *Xenopus* oocytes. However, the apertures for these electrodes are typically too large (5-10 μm) for patching many small cells of interest.

We now present a new design that precisely defines a round, 2 μm diameter aperture for the electrodes. The PDMS electrodes are micromolded by sandwiching PDMS between two micromachined silicon masters. The top master defines the size and shape of the aperture and the bottom master defines the cavity for electrode solution. This new planar array of patch electrodes should permit “blind” patch clamping in which a dense suspension of cells may be dropped onto the array to produce high resolution patch clamp recordings with ease.