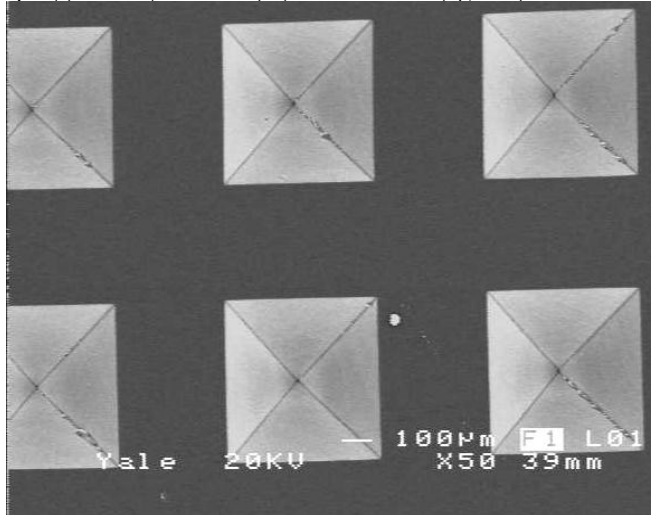


Patch clamping with a planar electrode array

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We have microfabricated a planar electrode array for use as patch-clamp electrodes. The device consists of a planar partition (400 μm thick) having an array of small apertures (1-5 μm diameter, spaced 1 mm apart) that is sealed to a circuit board containing a corresponding array of Ag/AgCl contacts. A switching circuit connects each electrode to an amplifier on board. The partition is micromolded in the silicone elastomer, poly(dimethylsiloxane) (PDMS or "Sylgard") from a micromachined silicon master.



Surface treatment of the PDMS permits high resistance seals to cell membranes. Figure shows the backside of the partition where 600x600 μm pyramidal cavities contain the electrode solution.