multichannel systems

Microelectrode Array (MEA) Cleaning Quick Guide

MEA Cleaning and Storage

Cleaning the MEAs

Prepare a 1% solution of **Terg-A-Zyme** (Sigma, order number Z273287), diluted in distilled water. Place MEAs in this solution overnight at room temperature. Apply gentle shaking / rocking, if possible. After Terg-A-Zyme treatment, rinse thoroughly with distilled water. Terg-A-Zyme solution can be stored at 4 °C and reused for about a week. Dry the MEAs and apply **hydrophilic surface treatment** (see below), if necessary. If they are going to be used for cell or tissue culture, **autoclave** the MEAs at 121 °C for 30 min. Furthermore, it is advisable to keep track on the accumulated time a MEA spend in cell culture, and the number of cleaning procedures it went through. Do **not fix** cells or tissue on the MEAs. Detergent treatment will not remove fixed tissue. **NEVER** wipe or otherwise touch the electrode field.

Cleaning the MEA contact pads

Dirt on the contact pads of the MEA or on the pins of the MEA amplifier leads to bad contact and electrical noise. Pins and contact pads can be cleaned by wiping them with ethanol or **iso-propanol**.

Storing the MEAs

It is recommended to store the MEAs in distilled water in the fridge. After use, remove biological material with water. MEAs should be stored in this condition and completely cleaned (see above) immediately before the next use. Change the water the MEAs are stored in at least once a month.

Hydrophilic Surface Treatment

The surface of new MEAs is hydrophobic, and even hydrophilic MEAs tend to become hydrophobic again during storage. A hydrophobic surface prevents attachment and growth of the (hydrophilic) cells.

Plasma Cleaning

Laboratories with access to electron microscopy facilities are likely to have a sputter device or a plasma-cleaning chamber (for example, PDC-32G from Harrick Plasma, Ithaca, NY, United States). MEAs can be treated in these chambers with low-vacuum plasma for about two minutes. The MEA surface is exposed to a gas plasma discharge, which will make the surface polar and thus more hydrophilic. The treatment gives a very clean and sterile surface that can be coated readily with water-soluble molecules. Note that the effect wears off after a few days.

Protein Coating

If **plasma treatment is not available** and protein coating is acceptable in the planned experiments, there is another way to render the surface hydrophilic. Clean and sterilize the MEAs as described above. Place approximately 1 ml of a concentrated, sterile protein solution (for example, albumin, fetal calf serum or similar) onto the culture region for about 30 min. Wash the culture chamber thoroughly with sterile water afterwards. The MEA can then be directly used for cell culture.

This is just a quick guide. For complete information about MEA handling please refer to the MEA Manual.