Histology and Retention of Implanted Carbon Fiber Thread Electrodes in Fixed Tissue

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AUG 24, 2023

OPEN ACCESS

ABSTRACT

Methods to cut and retain implanted carbon fiber electrodes in brain tissue are described.

DOI:
dx.doi.org/10.17504/protocols.io.6qpvr4nm3gmk/v1

Protocol Citation: Helen N Schwerdt, Tomoko Yoshida, Ann M Graybiel 2023. Histology and Retention of Implanted Carbon Fiber Thread Electrodes in Fixed Tissue . **protocols.io** https://dx.doi.org/10.17504/protocols.io.6qpvr4nm3gmk/v1

Protocol status: Working
We use this protocol and it's working

Created: Apr 11, 2023

Last Modified: Aug 24, 2023

PROTOCOL integer ID: 80334

1 Rats were deeply anesthetized with Euthasol (pentobarbital sodium and phenytoin sodium from Virbac AH Inc.), then transcardially perfused with 0.9% saline solution followed by 4% paraformaldehyde in 0.1 M phosphate buffer (PB).

2 The implanted electrodes were cut just above the skull and below the copper wire bundle component of the device with a rotary saw (Dremel) to retain the flexible Py-CF portion of the device in the fixed brain tissue.

3 Brains were removed from the skull, post-fixed for 24 hours in the same fixative solution and stored in 25% glycerol with 0.075% sodium azide in 0.1 M PB overnight or until cutting.

4 To prepare sections, brains were frozen on dry ice then cut in the transverse plane on a freezing microtome with a microtome knife (C. L. Sturkey, Inc. #K185A).

5 Sections were cut sequentially, with four sections at 25-µm then one section at 100-µm, repeated until the end of the frozen block of brain.

6 The 100-µm sections were immediately mounted onto glass slides and air dried, whereas the 25-µm sections were stored in 0.1% sodium azide in 0.1 M PB at 4°C until use.