



NEW Microwave Brain Fixation System

Cat. MMW-05 (5kW)

General

In neurochemical studies of the brain, it is of great importance to accurately measure neurochemical events *in vivo*.

However, it is difficult to perform reproducible measurement of these events because rapid post-mortem changes occur in the brain concentrations of metabolites and neurotransmitters.

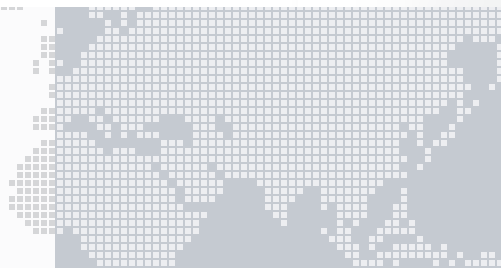
With the NEW Microwave Brain Fixation System by Muromachi, a living mouse or rat is positioned inside the applicator and, in less than 1 second, the microwave beam stops all brain chemistry at the level present in the living animal.

Measuring brain chemistry *in-vivo* is possible!



**BRAIN FIXATION
OCCURS IN 1 SECOND**

**ACTIVITY OF DEGRADING
ENZYMES IS BLOCKED**



Prior to analysis of:

- Phosphorylated proteins
- Acetylcholine, Serotonin, Endorphins
- Prostaglandins, Catecholamines
- C-AMP, C-GMP, GABA, DOPA

NEW features:

- Improved usability - touch screen
- Air-cooled (no water circulation)
- CE-certified
- Absolute safety - negligible leakage

Various techniques have been developed to **prevent post-mortem changes**. One of the more common method is cooling or freezing by immersion of the living animal and the decapitated head in liquid Nitrogen or cooled Freon to **inactivate enzymes** involved in the metabolism of these compounds. **Cooling is not fully effective in preventing post-mortem changes** as the time required to freeze deep structure of the brain may range from 10 - 90 seconds; post-mortem changes will occur during this period.

An alternate method is microwave heating to inactivate enzymes.

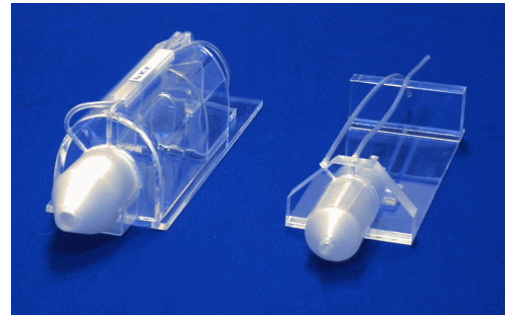
The microwave method has several advantages over cooling or freezing:

- The enzymes in the whole brain can be completely inactivated in a very short time
- The brain can be dissected easily and reproducibly at room temperature

Microwave fixation system must be such as to satisfy the following criteria:

1. Can elevate the temperature of brain up to 75-90°C as rapidly as possible by effectively focusing microwave energy on the head of an animal
2. Will give the same results from animal to animal
3. The apparatus should be easily and safely used since personnel not experienced in microwave technology will use it
4. Muromachi Microwave Fixation Systems are safely designed, so that the microwave leakage will not exceed 1 mW/cm²

The Microwave Fixation System comes with specific applicator heads and animal holders (shown below).



Ordering Information

MMW-05 Microwave System 5KW

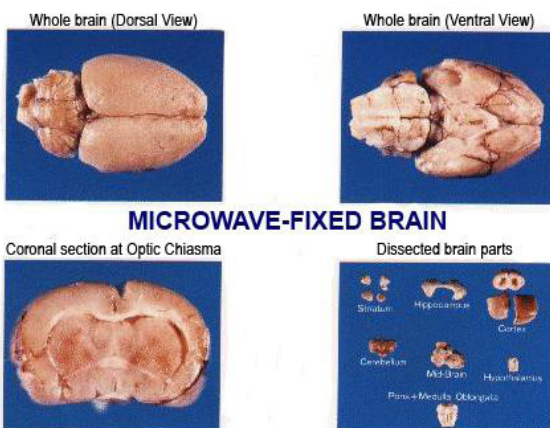
(including 1 Applicator head and 1 animal holder); PN MMW-05

Applicator heads for mice (PN TAW-174P), for 150-250 g rats (PN TAW 424SP), for 250-500 g rats (PN TAW 424MP)

Animal holders for 15-20 g mice (WJLM 24), for 20-40 mice (WJM-28), for 150-250 g rats (WJR-S), for 250-400 g rats (WJR-M), for 400-500 g (WJR-L)

Bibliography

- B. Sahin *et al.*: "Evaluation of neuronal phosphoproteins as effectors of caffeine and mediators of striatal adenosine A2A receptor signaling". *Brain Research*, 2006, 1120, 1-14.
- P. Svenningsson *et al.*: " DARPP-32 mediates serotonergic neurotransmission in the forebrain". *PNAS* 2002, vol. 99, no. 5.
- G.L. Caporaso *et al.*: "Drugs of abuse modulate the phosphorylation of ARPP-21, a cyclic AMP-regulated phosphoprotein enriched in the basal ganglia". *Neuropharmacology* 39 (2000) 1637-1644.
- A. Nishi *et al.*: "Amplification of dopaminergic signaling by a positive feedback loop". *PNAS Early Edition* 2000, 1-6.



MICROWAVE-FIXED BRAIN