

Intermediate frequency magnetic field exposure facility for in vivo studies

Purpose:

Although the intermediate frequency magnetic field (MF) from 300Hz upto 10MHz has become widely used lately, potential health effects of MF in these frequencies are not yet fully studied. This facility is capable of exposing experimental animals to uniform intermediate frequency MFs, either 20kHz or 60kHz, continuously. The experimental animals such as rats or mice are housed under controlled room temperature and humidity of the specific pathogen free atmosphere.

Main Applications:

This facility is built to evaluate the effect of whole body exposure to intermediate frequency MF in experimental animals.

Specifications:

MF exposure coils are placed in the animal exposure room in the facility. Animals are housed in cages that are placed in the middle of the coil.

1) MF exposure coil

- Coil: Merritt-type with 4 wooden square bobbins; 1.6m(D) × 1.6m(W) × 2.2m(H)
- Magnetic field: sinusoidal wave form, vertical orientation; 0.2 mT(rms) at 20kHz or 0.1mT(rms) at 60kHz; variability less than 2%
- Power source: output current 7.4 A(rms) at 20 kHz; 14.1 A(rms) at 60kHz; 2.5kW/facility
- Others: ultrasonic sound, vibration, and acoustic noise were below the levels that could affect the experimental animals

2) Animal exposure facility

- Building: two identical buildings, one for 20 kHz and the other for 60 kHz exposure (9m × 9m × 5m) ; when one building is employed for exposure, the other building is for sham exposure
- Rooms: MF exposure room, air shower room, pass room, locker room, entrance room, machinery room

3) MF exposure space

- Exposure room: barrier system; temperature, 23±2°C; relative humidity, 50±20% ; air suspended particulates, JIS(B-9920) class 7; air pressure, +30 Pa; illumination, 150 to 300 lux; room air velocity, less than 20 cm/s
- Animal housing capacity: 27 cages/building, 3 shelves/coil, 9 rat-cages/shelf
- Animal housing equipments: The cage body as well as the lid are all made of non-conductive materials to avoid disturbance of MF and heating due to the eddy current associated with the MF exposure

Location and Date of Installation:

Abiko Campus, March 2006



MF exposure coil