

## Surgical Note

### Recommendations for Implantation of EEG/EMG Devices in Rats and Mice

It is important to ensure that there is enough extra lead length to allow for normal postures and movement in the animal. If the device is going to be used on subsequent animals, a general guide is to leave 1 to 1.5 cm additional lead length for each additional animal that the device will be reused in. This can be looped and tucked into the device pocket. If the leads become too short, they can be coupled with new lead material to lengthen.

For EEG lead placement on the skull:

- Always use the screw method to affix the lead to the skull instead of the direct wire method. Data has shown that the signals are much cleaner and less noisy with the screw method.
- Be sure to remove any bone fragments from the holes being drilled in the skull prior to placing the screws. This can be done with a fine tip forceps.
- Score the skull in a crosshatch pattern prior to applying the dental acrylic. This will create more surface area for the dental acrylic to adhere to.
- Make sure that all exposed metal is completely covered with the dental acrylic. Any exposed metal will result in ECG artifact on your EEG signals.
- Be sure to tie suture around the leads as pictured in the manual prior to applying the dental acrylic. This will help ensure that the silicone tubing doesn't slip back from the leads after placing the dental acrylic. If the tubing slips back revealing exposed wire, this will result in movement and ECG artifact on your EEG signal.

For EMG lead placement:

- Ensure that there is enough extra lead material to allow for natural postures and movements of the animal. If the lead is stretched to tight, it can easily pull out of the muscle.
- As shown in the manual, it is important to tie suture around the silicone tubing at the EMG entry point as well as the tip cover portion of the lead. This will hold the EMG lead securely in place and prevent it from pulling out.
- Make sure that the EMG wire is completely embedded in muscle and there is no exposed wire once the leads are secured in place. Any exposed wire will result in ECG artifact.

If you are seeing a lot of movement or ECG artifact on your signals, it is important to carefully necropsy the animal to determine the cause of the artifact so it can be mitigated in subsequent animals.