# Nerve Conduction Velocity Tests

Version: 2
Replaced by version:  1
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## Summary:  To confirm the presence of diabetic neuropathy, nerve conduction velocity (NCV) studies are performed.  The animals are anesthetized with isoflurane to prevent discomfort.  Body temperature is monitered with a dermal temperature probe and maintained at 32º C with a warming lamp during NCV.  Body temperature is maintained at 37ºC after NCV using a warming pad to ease animal stress from anesthetic.  The nerve studies last less than 30 min per rat or mouse. The electrodes are cleaned with 70% alcohol between animals to maintain pathogen-free status.

## Reagents and Materials:

Equipment:

> **Nicolet VikingQuest Portable System with Nerve Conduction Studies VikingQuest software run on Windows 7**
> Nicolet 12mm .4mm diameter disposable platinum EEG subdermal needles
> Niclot disposable ground
> Heating lamp
> Infrared thermometer
> Heating pad
> Flexible tape measure
> 8"x 8" Styrofoam
> Isoflurane, 5% induction and 1-2% maintenance.

# Protocol:

Settings:

Motor tests
- o Duration .02 ms
- o Range 25 mA
- o low frequency filter 1 Hz
- o High frequency filter 10 kHz
- o Sensitivity 1 mV
- o Time 2 ms/div

Sensory test
- o Duration .02 ms
- o Range 25 mA
- o low frequency filter 1 Hz
- o High frequency filter 10 kHz
- o Sensitivity 50 µV
- o Time 2 ms/div

Procedure:

To confirm the presence of diabetic neuropathy, nerve conduction velocity (NCV) studies are performed. The animals will be anesthetized with isoflurane. Body temperature is monitored with a dermal temperature probe and maintained at 34° C with a warming lamp during NCV. Skin temperature is maintained at 32° C during NCV using an infrared thermometer. Body temperature is maintained at 34°C after NCV using a warming pad to ease animal stress from anesthetic. The nerve studies will last less than 15 min per rat or mouse. The electrodes are cleaned with 70% alcohol between animals to maintain pathogen-free status.

**Sciatic-tibial motor NCV** is determined by stimulating distally at the sciatic notch and distally at the ankle via bipolar electrodes with supramaximal stimulation. The conduction velocity is calculated using two the points of stimulation along the nerve and measuring the resultant onset latency and distance.

**Sural Sensory NCV** is determined by stimulating the sural nerve distally at the ankle via bipolar electrodes with supramaximal stimulation and recording at the fourth and fifth digit. The conduction velocity is calculated using the onset latency and distance.

**Tail motor latency** is determined by stimulating distally along the tail at a recorded distance of 3 cm.  The onset latency is used for the latency measurement.

**Tail sensory NCV** is determined by stimulating proximally along the tail at a recorded distance of 3 cm.  The Conduction velocity is calculated using the onset latency and distance.