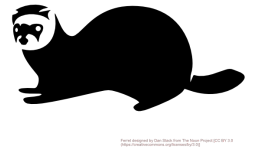


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# SPARC - Gastrointestinal myoelectric recordings from the behaving ferret

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Charles C Horn<sup>1</sup>, Derek M. Miller<sup>1</sup>, Stephanie Fulton<sup>1</sup>, Bill J. Yates<sup>1</sup>, Lee E. Fisher<sup>1</sup>, Ameya C. Nanivadekar<sup>1</sup>

<sup>1</sup>University of Pittsburgh

SPARC

Tech. support email: [info@neuinfo.org](mailto:info@neuinfo.org)



Charles C Horn

University of Pittsburgh

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**Protocol status:** Working

**We use this protocol and it's working**

**Created:** August 08, 2019



**Last Modified:** August 10, 2019

**Protocol Integer ID:** 26688

**Keywords:** gastrointestinal tract, stomach, intestine, vagus nerve, electrophysiology, behavior

## Abstract

This protocol provides the steps for recording the gastrointestinal myoelectric responses and stimulation of the abdominal vagus nerve from the behaving ferret. These tests occur after an animal is surgically implanted with gastrointestinal and vagus nerve electrodes (see the protocol "SPARC - Chronic implantation of gastrointestinal and vagus nerve electrodes in the ferret" for implantation methods).

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## Guidelines

The following guidelines are important:

- 1) care must be taken to not damage the head connector (e.g., getting debris inside the connection)
- 2) a ferret will often play with the tether, especially during initial exposure; therefore, the position of the tether will need to be manipulated manually to avoid the animal getting tangled

## Materials

### MATERIALS

☒ feeding tube **Bio-Serv Catalog #9012**

☒ Emetine dihydrochloride hydrate **Merck MilliporeSigma (Sigma-Aldrich) Catalog #45160**



## Room setup

- 1  
  
Cover floor of behavioral test chamber with layer of Alpha-dri bedding. The floor of the plexiglas chamber is 51 × 51 cm  
(<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3348962/>)
- 2  
  
Turn off all lights except lamp over testing chamber.
- 3  
  
Set up video camera directly above chamber so that entire area is visible with minimal shadows. Set up a second camera to view the feeding tube from the side for feeding trials to track volume consumed.

### Equipment

video camera	NAME
camera	TYPE
Sony	BRAND
HDR-XR550V	SKU

- 4  
  
Suspend tether ~50 cm above chamber and secure with rubber bands to provide elasticity as the animal moves.
- 5  
  
Keep the room quiet during recording except for white noise.

## Animal

- 6  
  
Animal should be fasted 3 hours before starting recording.
- 7  
  
Place animal in chamber and allow 10 minutes for acclimation.

- 8 Connect animal to tether.
- 9 During testing, hold the tether straight above the animal out of its reach, but with some slack. If the animal tries to grab the tether, especially during adaptation, a plastic straw can be inserted through the breathing holes in the side of the chamber to distract the animal from the tether.

## Recording: Baseline control

- 10 Record electrode impedances before the recording begins.

### Equipment

Grapevine Neural Interface Processor and a Nano2 recording headstage	NAME
electrophysiological recording and stimulation	TYPE
Ripple LLC	BRAND
Grapevine Neural Interface Processor and a Nano2 r	SKU

- 11 Electrophysiological recording and video recording should be started at the same time.

## Equipment

### Media Recorder

NAME

video to computer recording system

TYPE

Noldus Information Technology

BRAND

MediaRecorder

SKU

<https://www.noldus.com/human-behavior-research/products/mediarecorder><sup>LINK</sup>

- 12 Record 1 h of baseline data for control days.

## Recording: Feeding

- 13 For feeding trials, introduce Ensure liquid diet in a graduated tube (100 ml Richter glass feeding tube) attached to the side of the chamber at 10 min after the start of recording. Remove the feeding tube 45 min after presentation. Finish with 10 min of baseline recording.

## Equipment

### Grapevine Neural Interface Processor and a Nano2 recording headstage

NAME

electrophysiological recording and stimulation

TYPE

Ripple LLC

BRAND

Grapevine Neural Interface Processor and a Nano2 r

SKU

## Recording: Feeding with vagus stimulation



- 14 For feeding with stimulation trials, introduce Ensure at the same time as in Step 13. Start stimulation 2 minutes after food introduction. Stop stimulation and remove food at the same time, i.e., minute 45 in the recording. Finish with 10 minutes of baseline

#### Equipment

Grapevine Neural Interface Processor and a Nano2 recording headstage	NAME
electrophysiological recording and stimulation	TYPE
Ripple LLC	BRAND
Grapevine Neural Interface Processor and a Nano2 r	SKU

### Recording: Emetiine (emesis testing)

- 15 For emetine trials, begin infusion at the 10 min in the recording. Infusion rate is 10ml/min. Record for 1 hour after infusion has ended.

#### Equipment

Grapevine Neural Interface Processor and a Nano2 recording headstage	NAME
electrophysiological recording and stimulation	TYPE
Ripple LLC	BRAND
Grapevine Neural Interface Processor and a Nano2 r	SKU

- 15.1 After recording is done, animal should be monitored until there is no further emesis.



## Recording: Water control

- 16 For water control trials, follow Step 15.

### Equipment

**Grapevine Neural Interface Processor and a Nano2 recording headstage**

NAME

electrophysiological recording and stimulation

TYPE

Ripple LLC

BRAND

Grapevine Neural Interface Processor and a Nano2 r

SKU

## End

- 17 Stop electrophysiological and video recordings at the same time.

- 18 Measure impedances at the end of each recording.

### Equipment

**Grapevine Neural Interface Processor and a Nano2 recording headstage**

NAME

electrophysiological recording and stimulation

TYPE

Ripple LLC

BRAND

Grapevine Neural Interface Processor and a Nano2 r

SKU