The Center for Autonomic Recording and Stimulation Systems (CARSS)

sites.usc.edu/CARSS

The CARSS Team

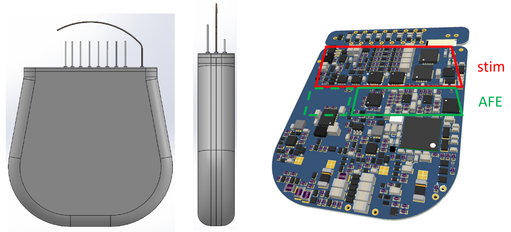
USC Viterbi School of Engineering

MED - ALLY

Medipace Inc

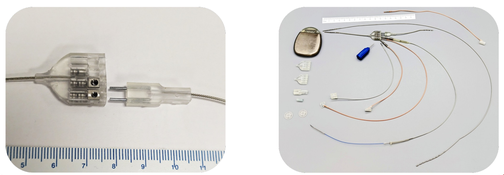
Developing **open-source**, **closed-loop** autonomous neuromodulation systems for **human use**.

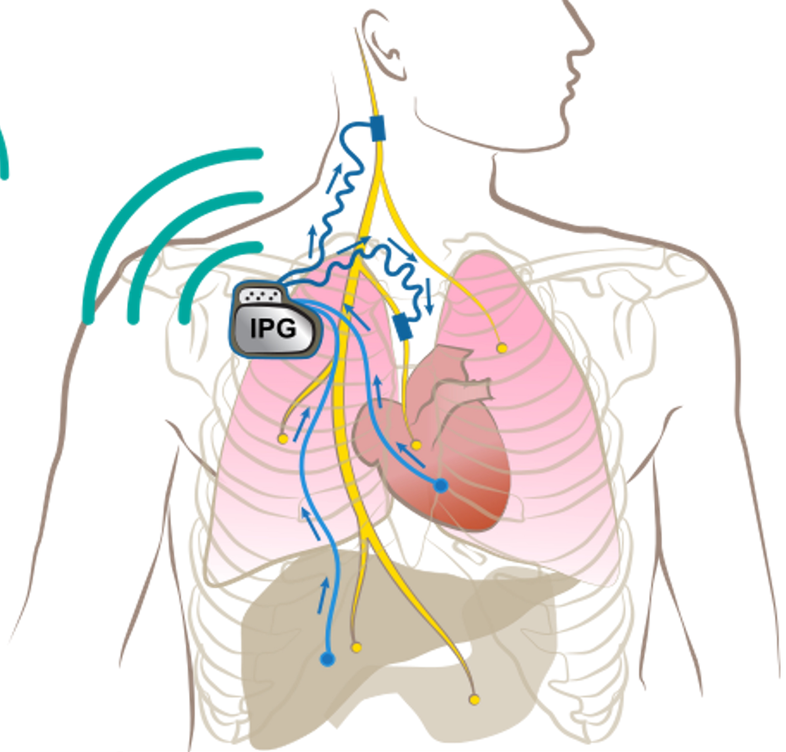
Implantable Pulse Generator



- Bluetooth Low Energy (BLE) communication
- Software and firmware for closed loop operation
- Option for rechargeability

Leads and Universal Connectors



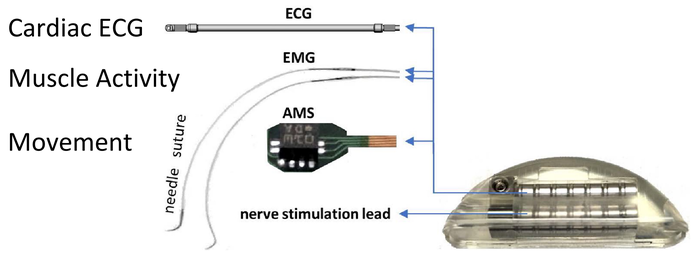


Funded by

NIH SPARC

#U41-NS129514

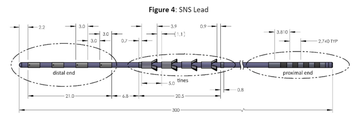
Biomarker Sensing



Stimulation

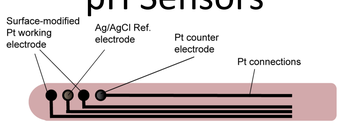
Vagus Nerve Cuff Electrode

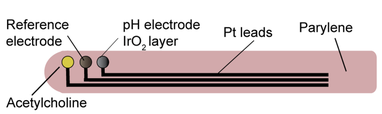
Sacral Nerve Electrode



Next-Generation Interfaces

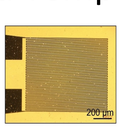
Neurotransmitter and pH Sensors

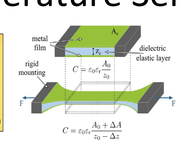




Parylene C Cuff for Branch Nerves (<1 mm diameter)

Strain and Temperature Sensors





Project Milestones

2023

First Design Document Release (June)
Fabricate first test articles
Begin benchtop testing

2024

Complete bench testing
Large animal study – NEST 1-3
Small animal study – NEST 4, 5

2025

Release final design docs
Release regulatory documentation
First in Human use (w. collaborators)

Key Personnel

University of Southern California
Ellis Meng – PI
Maral Mousavi – Co-Investigator
Hangbo Zhao – Co-Investigator
Sahar Elyahoodayan - Director

Medipace Inc.
Victor Pikov - PI

Med-Ally LLC
Raja Hitti – PI
Jayme Coates – Project Manager

Community Resources

CAD Models

PCBA Schematic and Layout Files

Software and Firmware Code

Test Results

Quality and Regulatory Documents

github.com/CARSSCenter
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