

# University of Houston - Biomedical Engineering Seminar

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Via Zoom: <https://uh-edu-cougarnet.zoom.us/j/93512038041>

## Direct Spleen-Vagus Nerve Communication Uncovered By Platinized Graphene Fiber Electrodes



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### Abstract

The spleen is a main organ with vital functions and a main component in the neuro-inflammatory reflex. We used a reduced liquid crystalline graphene oxide (rGO, 40  $\mu\text{m}$  diameter) fiber coated with platinum (Pt) as a super-flexible suture-like electrode to use as a handover knot to interface multiple neurovascular plexus (NVP), allowing sensitive recording from four splenic NVPs. The vagus nerve, as the main autonomic nerve and brain-periphery autonomic link, has been suggested as a spleen modulator on the inflammatory reflex. We demonstrate that electrical stimulation of cervical and sub-diaphragmatic vagus nerve, evokes activity in a subset of SN terminal branches, providing evidence for a direct VN control over the spleen. Adenoviral tract-tracing revealing an unconventional direct brain-spleen projection. We propose the high-performance Pt-rGO fiber electrodes, to be used for the fine neural modulation of other small neurovascular plexus at the point of entry of major organs that could be used as a bioelectronic medical alternative.

### Biosketch

Dr. González, a Grass Foundation Fellow, received her Ph.D. in Biomedical Sciences from the Neurobiology Institute, UNAM, Mexico. She combines Neurosciences and Biomedical Engineering to study the bidirectional integration of central and peripheral neuronal signaling. She discovered new cellular niches in the periventricular zone of the cerebellum, and she proposed it to be a window of neuro-humoral communication with peripheral systems. She joined Dr. Romero-Ortega's group, in 2016. Her projects included the study of function and selective neuromodulation of the autonomic nervous system during hypertension. Her philosophy promotes diversity and inclusion for minorities. She believes that multidisciplinary and collaborative work is fundamental to advance science and celebrate discovery.