

No Stroke

Retrograde
Neuronal
Tracing



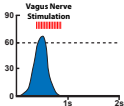
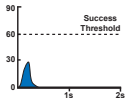
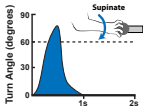
Rehab



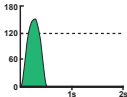
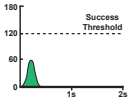
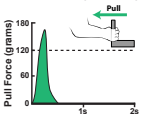
Rehab + Vagus Nerve Stimulation



**New synaptic
connections from
cortex to trained
forelimb**



**Long lasting
improvement on
trained task**



**Generalization of
recovery to a similar,
untrained task**

Arm and hand function is commonly impaired after stroke. Here we show that brief bursts of vagus nerve stimulation (VNS) delivered during motor rehabilitation triples the number of synaptic connections from motor cortex to muscles of the trained forelimb compared to rehabilitation alone. VNS paired with rehabilitation doubled recovery of forelimb rotation function, and the benefits persisted for months following cessation of VNS. Moreover, VNS-dependent recovery generalized to a similar, untrained task emphasizing forelimb strength.