C-fos

C-fos is used to identify system-wide neural activation with cellular resolution in vivo. However, c-fos can only capture neural activation of one event. Targeted recombination in active populations (TRAP) allows the capture of two different c-fos activation patterns in the same animal. So far, TRAP has only been used to examine brain circuits. This study uses TRAP to investigate spinal circuit activation during resting and stepping, giving novel insights of network activation during these events. The level of co-labeled (c-fos+ and TRAP+) neurons observed after performing two bouts of stepping suggests that there is a probabilistic-like phenomenon that can recruit many combinations of neural populations (synapses) when repetitively generating many step cycles. Between two 30-minute bouts of stepping, each consisting of thousands of steps, only ~20% of the neurons activated from the first bout of stepping were also activated by the second bout. We also show co-labeling of interneurons that have been active during stepping and resting. The use of the FosTRAP methodology in the spinal cord provides a new tool to compare the engagement of different populations of spinal interneurons in vivo under different motor tasks or under different conditions [1)].

1)
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