**Manuscript Title:** Sensorimotor integration within the primary motor cortex by selective nerve fascicle stimulation  
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**Animal model used, if applicable:** -  
**Underlying hypothesis:** Selective sensory fiber stimulation evokes a detectable activity in the primary somatosensory cortex and it produces a short-latency inhibitory effect on the output of the primary motor cortex

**Definitions of 'n':**  
- Question 1: n = number of tested stimulation sites  
- Question 2: n = number of stimulation sites evoking sensory perceptions  
- Question 3: n = number of stimulation sites evoking motor responses  
- Question 4: n = number of recorded EEG sweeps after peripheral nerve stimulation  
- Question 5: n = number of recorded EEG sweeps after peripheral nerve stimulation  
- Question 6: n = number of recorded motor evoked potentials  
- Question 7: n = number of recorded motor evoked potentials  
- Question 8: n = number of recorded motor evoked potentials  
- Question 9: n = number of recorded motor evoked potentials

**Statistical summary table:**

| Experimental question number | Finding/conclusion | Experimental location/variable | Measure of central tendency (Median) | Dispersion (IQR) | n | Exact P value | Figure/table in which data are presented | Units | Data comparisons | Statistical test | Any other experimental factors | Comments |
|-----------------------------|--------------------|-------------------------------|-------------------------------------|------------------|---|---------------|------------------------------------------|-------|----------------|----------------|------------------------|----------|
| 1. | To confirm activation of somatosensory and/or motor fibers by intraneural (IN) and perineural (PN) stimulation at different sites (i.e., electrode contacts) | IN sites selectively activate sensory fibers at low stimulation intensity | Left median nerve - Threshold stimulus intensity for evoking sensory perception and CMAP | - | - | 30 | - | Table 1, Fig. 3A | μA | - | Observation |
| 2. | To compare efficacy of IN and PN stimulation in activating somatosensory fibers | PN stimulation requires higher charge to recruit somatosensory fibers | BM threshold CM threshold | 25.60 80.00 | 16.00 - 48.00 75.00 - 100.00 | 15 12 | <0.0001 | Fig. 2 | nC nC | IM vs CM threshold | Mann-Whitney |
| 3. | To determine efficacy of IN and PN stimulation in activating motor fibers | PN stimulation requires higher charge to recruit motor fibers | CMAP recruitment curve with IN stim. CMAP recruitment curve with CM stim. | - | - | 3 12 | - | Fig. 3B | mV mV | - | Observation |
| 4. | To confirm evoked activity in the primary somatosensory cortex (S1) by transcutaneous whole nerve stimulation | Presence of the first cortical potential at ~17 ms | Right central region on the scalp | - | - | >2000 | - | Fig. 4A-C | μV | - | Observation |
| 5. | Detectable evoked activity in S1 by intraneural (IN) stimulation? | Presence of the first cortical potential at ~16 ms | Right central region on the scalp | - | - | >7000 | - | Fig. 4D | μV | SEPs by IN vs transcutaneous stimulation | Observation |
### 6. Short-latency afferent inhibition (SAI) of MEPs by invasive nerve stimulation?

| Site: all IN and PN | MEP inhibited by IN/PN afferent stimulation | ISIs and SIs | MEP amplitude (mV) | Ratio vs MEP uncond | P-value |
|---------------------|---------------------------------------------|--------------|--------------------|-------------------|---------|
| MEP_uncond          | 0.9480                                      | 0.7322 - 1.2463 | 72                 | <0.0001           |
| MEP_ISI15-21        | 0.7135                                      | 0.4823 - 0.9067 | 246                |                   |
| MEP_high variable   | 0.9766                                      | 0.6244 - 1.761 | 12                 |                   |
| MEP_ISI15-16        | 0.5216                                      | 0.3185 - 0.7512 | 12                 | 0.0056            |
| MEP_ISI17-19        | 0.5189                                      | 0.2459 - 0.6702 | 18                 | 0.0005            |
| MEP_ISI20-21        | 0.5216                                      | 0.3185 - 0.7512 | 12                 | <0.0001           |
| MEP_low variable    | 0.9766                                      | 0.6244 - 1.761 | 12                 |                   |
| MEP_ISI15-16        | 0.3409                                      | 0.3024 - 0.4847 | 11                 | 0.0003            |
| MEP_ISI17-19        | 0.5608                                      | 0.3130 - 1.2687 | 18                 | 0.6615            |
| MEP_ISI20-21        | 0.8623                                      | 0.5800 - 1.2833 | 11                 | 0.7399            |
| MEP_higher variable | 0.9766                                      | 0.6244 - 1.761 | 12                 |                   |
| MEP_ISI15-16        | 0.5743                                      | 0.4302 - 0.7747 | 10                 | 0.0804            |
| MEP_ISI17-19        | 0.8080                                      | 0.6734 - 1.2903 | 18                 | 0.8187            |
| MEP_ISI20-21        | 0.7766                                      | 0.5497 - 1.0317 | 11                 | 0.6505            |
| MEP_lowest variable | 0.9238                                      | 0.7281 - 1.3236 | 12                 |                   |
| MEP_ISI15-16        | 0.4691                                      | 0.2912 - 0.8016 | 12                 | 0.1445            |
| MEP_ISI17-19        | 0.8294                                      | 0.6155 - 0.8890 | 18                 | 0.2486            |
| MEP_ISI20-21        | 0.7199                                      | 0.4266 - 1.3788 | 12                 | 0.4428            |
| MEP_lowest variable | 0.9238                                      | 0.7281 - 1.3236 | 12                 |                   |
| MEP_ISI15-16        | 1.0070                                      | 0.7925 - 1.1718 | 12                 | 0.0045            |
| MEP_ISI17-19        | 0.5930                                      | 0.4705 - 0.8073 | 12                 | 0.0014            |
| MEP_ISI20-21        | 0.7285                                      | 0.5830 - 0.8265 | 18                 |                   |
| MEP_lowest variable | 0.8810                                      | 0.7476 - 1.2036 | 12                 |                   |
| MEP_ISI15-16        | 0.7285                                      | 0.5830 - 0.8265 | 18                 |                   |
| MEP_ISI17-19        | 0.8294                                      | 0.6155 - 0.8890 | 18                 |                   |
| MEP_ISI20-21        | 0.7199                                      | 0.4266 - 1.3788 | 12                 |                   |
| MEP_lowest variable | 0.8810                                      | 0.7476 - 1.2036 | 12                 |                   |
| MEP_ISI15-16        | 0.8925                                      | 0.8124 - 1.0975 | 12                 |                   |
| MEP_ISI17-19        | 0.6819                                      | 0.5788 - 0.9856 | 18                 |                   |
| MEP_ISI20-21        | 0.8344                                      | 0.6683 - 0.9656 | 12                 |                   |
| MEP_lowest variable | 0.8925                                      | 0.8124 - 1.0975 | 12                 |                   |
| MEP_ISI15-16        | 0.7199                                      | 0.4266 - 1.3788 | 12                 |                   |
| MEP_ISI17-19        | 0.6819                                      | 0.5788 - 0.9856 | 18                 |                   |
| MEP_ISI20-21        | 0.8344                                      | 0.6683 - 0.9656 | 12                 |                   |
| MEP_lowest variable | 0.8925                                      | 0.8124 - 1.0975 | 12                 |                   |

### Control condition: no MEP inhibition at an ISI shorter than the physiological range

| Site: IN and PN | MEP inhibited at IN and PN | ISIs and SIs | MEP amplitude (mV) | Ratio vs MEP uncond | P-value |
|-----------------|---------------------------|--------------|--------------------|-------------------|---------|
| MEP_uncond      | 0.9360                     | 0.5368 - 1.2820 | 14                 | 0.4940            |
| MEP_ISI8         | 1.1450                     | 0.6937 - 1.4997 | 12                 |                   |

### 7. SAI magnitude at different IN and PN stimulation sites?

| SAI | SAIs between sites | Ratio vs SAI_increasing range | P-value |
|-----|--------------------|-------------------------------|---------|
| SAI_IM12 | SAI_IM10   | 0.3830 | 0.2506 - 0.6523 | 42 | <0.0001 |
| SAI_IM16 | SAI_IM10   | 0.7019 | 0.3640 - 1.2173 | 40 |         |
| SAI_CM5 | SAI_CM5+14 | 0.7441 | 0.5377 - 1.0230 | 39 |         |
| SAI_CM5+14 | SAI_CM5  | 0.7277 | 0.4155 - 1.0525 | 42 |         |
| SAI_CUS | SAI_CUS+14 | 0.7110 | 0.5440 - 0.9090 | 41 |         |
| SAI_CUS+14 | SAI_CUS  | 0.8406 | 0.6296 - 0.9917 | 42 |         |

| SAI | Ratio vs SAI_increasing range | P-value |
|-----|-------------------------------|---------|
| SAI_IM12>SAI_IM16 | SAI.IM12 | 0.0010 |         |
| SAI_CM5>SAI_CM5+14 | SAI.IM12 | <0.0001 |         |
| SAI_CM5+14>SAI_CM5 | SAI.IM12 | 0.0007 |         |
| SAI_CUS>SAI_CUS+14 | SAI.IM12 | <0.0001 |         |
| SAI_CUS+14>SAI_CUS | SAI.IM12 | <0.0001 |         |
| SAI magnitude at different ISIs by invasive (IN and PN) different stimulation? | SAI depends on ISI | SAI_ISI15-16 | SAI_ISI15-17 | SAI_ISI15-19 | SAI_ISI15-20 | SAI_ISI15-16 vs SAI_ISI17-19 vs SAI_ISI20-21 | P value | Fig. 6B | ratio | Kruskal-Wallis |
|---|---|---|---|---|---|---|---|---|---|---|
| | SAI_ISI16-17 > SAI_ISI15-16 | 0.6388 | 0.3591 - 0.8373 | 0.7766 | 0.4960 - 0.9639 | 0.4276 - 0.8263 | 0.0374 | | | |
| | SAI_ISI16-18 > SAI_ISI15-18 | 0.8258 | 0.5900 - 0.9639 | 0.7766 | 0.4960 - 0.9639 | 0.4276 - 0.8263 | 0.0472 | | | |

| SAI magnitude at different muscle targets by transcutaneous whole-nerve stimulation? | SAI is lower in the amputated side | SAI_BB.R>MFM.R | SAI_BB.L+MFM.L | 0.4341 | 0.3189 - 0.5359 | 0.6724 | 0.6100 - 0.7288 | 0.0001 | Fig. 7 | ratio | Sr.I vs Sr.L | Kruskal-Wallis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SAI_BB.R > SAI_BB.L | 0.4837 | 0.4238 - 0.6526 | 0.6517 | 0.6039 - 0.7106 | 0.3056 | 0.2638 - 0.3474 | 0.0005 | | ratio | SAI_BB.R vs SAI_BB.L | Mann-Whitney |
| | SAI_MFM.R > SAI_MFM.L | 0.3893 | 0.2955 - 0.4854 | 0.6860 | 0.6238 - 0.7386 | 0.3056 | 0.2638 - 0.3474 | 0.0001 | | ratio | SAI_MFM.R vs SAI_MFM.L | Mann-Whitney |

| SAI not significantly different between arm and forearm muscles | SAI_BB.R+L | SAI_MFM.R+L | 0.5697 | 0.8474 - 0.9053 | 0.5697 | 0.3940 - 0.6997 | 0.3611 | | | |
|---|---|---|---|---|---|---|---|---|---|---|

| SAI not significantly different between arm, forearm, and hand muscles of the intact side | SAI_BB.R | SAI_MFM.R | SAI_OP.R | 0.4637 | 0.4238 - 0.6526 | 0.3893 | 0.2955 - 0.4854 | 0.4460 | 0.2835 - 0.5934 | 0.0818 | | | |
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3/3