

**Spike timing-dependent plasticity in the mouse barrel cortex is strongly modulated by sensory learning and depends on activity of matrix metalloproteinase 9.**

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**Table 1 Intrinsic electrophysiological properties of excitatory neurons recorded in LII/III of naive, PSEUDO CS + UCS and CS + UCS animals**

|                         | Naive (n = 19)     | Pseudo CS + UCS (n = 14) | CS + UCS (n = 18)  |
|-------------------------|--------------------|--------------------------|--------------------|
| $V_m$ (mV)              | $-75.29 \pm 1.75$  | $-75.68 \pm 1.71$        | $-75.41 \pm 1.54$  |
| $R_{inh}$ (M $\Omega$ ) | $121.17 \pm 5.9$   | $119.44 \pm 6.9$         | $118 \pm 7.24$     |
| $R_{ind}$ (M $\Omega$ ) | $136.69 \pm 6.8$   | $131.93 \pm 6.67$        | $134.6 \pm 7.49$   |
| AP amplitude (mV)       | $77.73 \pm 1.67$   | $75.17 \pm 1.62$         | $78.27 \pm 1.66$   |
| fAHP (mV)               | $-10.39 \pm 0.76$  | $-9.88 \pm 0.6$          | $-9.93 \pm 0.8$    |
| AP half-width (ms)      | $1.26 \pm 0.08$    | $1.34 \pm 0.04$          | $1.4 \pm 0.1$      |
| Mean gain (Hz/pA)       | $0.15 \pm 0.01$    | $0.16 \pm 0.01$          | $0.14 \pm 0.01$    |
| AP threshold (mV)       | $-35.78 \pm 1.37$  | $-33.51 \pm 0.97$        | $-35.21 \pm 1$     |
| $\tau$ (ms)             | $14.83 \pm 1.11$   | $16.14 \pm 1.58$         | $16.27 \pm 1.15$   |
| mean threshold (mV)     | $165.71 \pm 11.86$ | $179.86 \pm 13.76$       | $170.58 \pm 14.59$ |

**Table 2 Intrinsic electrophysiological properties of LII/III pyramidal neurons recorded from control slices and slices treated by matrix metalloproteinases inhibitor FN-439**

|                         | control (n = 13)   | FN-439 treatment (n = 14) |
|-------------------------|--------------------|---------------------------|
| $V_m$ (mV)              | $-74.25 \pm 0.65$  | $-74.18 \pm 1.37$         |
| $R_{inh}$ (M $\Omega$ ) | $121.94 \pm 6.75$  | $125.58 \pm 11.7$         |
| $R_{ind}$ (M $\Omega$ ) | $140.21 \pm 9.78$  | $146.36 \pm 12.43$        |
| AP amplitude (mV)       | $73.2 \pm 1.7$     | $71.12 \pm 1.54$          |
| fAHP (mV)               | $-10.78 \pm 1.01$  | $-12.04 \pm 1.06$         |
| AP half-width (ms)      | $1.1 \pm 0.06$     | $1.17 \pm 0.06$           |
| Mean gain (Hz/pA)       | $0.21 \pm 0.01$    | $0.2 \pm 0.015$           |
| AP threshold (mV)       | $-35.38 \pm 1.04$  | $-33.33 \pm 1.18$         |
| $\tau$ (ms)             | $15.54 \pm 1.02$   | $15.38 \pm 1.16$          |
| mean threshold (mV)     | $190.76 \pm 15.73$ | $221.81 \pm 22.09$        |

**Table 3 Intrinsic electrophysiological properties of LII/III pyramidal neurons recorded from control slices and slices treated by matrix metalloproteases inhibitors (SB-3CT, NNGH)**

|                         | control<br>(n = 8) | control DMSO<br>(n = 8) | SB-3CT treatment<br>(n = 8) | <i>NNGH</i> treatment<br>(n = 7) |
|-------------------------|--------------------|-------------------------|-----------------------------|----------------------------------|
| $V_m$ (mV)              | -72.17± 1.57       | -71.19 ± 3.53           | -70.84 ± 1.71               | -75.3± 1.55                      |
| $R_{inh}$ (M $\Omega$ ) | 115.81 ± 11.8      | 119.67 ± 13.32          | 117.35 ± 12.78              | 128.18 ± 15.24                   |
| $R_{ind}$ (M $\Omega$ ) | 139.64 ± 18.85     | 138.91 ± 17.37          | 129.39 ± 14.49              | 148.25 ± 21.99                   |
| AP amplitude (mV)       | 76.72 ± 3.48       | 75.52 ± 3.24            | 74.06 ± 5.15                | 76.09± 4.62                      |
| fAHP (mV)               | -8.84 ± 0.69       | -9.6 ± 1.24             | -7.67 ± 0.84                | -7.96 ± 0.86                     |
| AP half-width (ms)      | 1.44 ± 0.14        | 1.27 ± 0.5              | 1.38 ± 0.09                 | 1.34 ± 0.16                      |
| Mean gain (Hz/pA)       | 0.15 ± 0.01        | 0.17 ± 0.02             | 0.15 ± 0.02                 | 0.15 ± 0.01                      |
| AP threshold (mV)       | -32.12± 1.47       | -33.61± 1.44            | -30.96 ± 2.19               | -34.81 ± 1.86                    |
| $\tau$ (ms)             | 12.43 ± 1.4        | 14.69 ± 1.77            | 12.96 ± 1.66                | 13.85 ± 0.79                     |
| mean threshold (mV)     | 190.31 ± 25.08     | 177.96 ± 32             | 184.93 ± 20.29              | 152.13 ± 25.04                   |