**Legend**

Blue cell is the example reported in the figure; Results of statistical test: “p” is for paired t-test.

**HEK cells currents (Figure 1)**

|  |  |  |
| --- | --- | --- |
| **AaH-II** | **Nav1.2 T50 change** | **Nav1.6 T50 change** |
| 0.01 nM | 0±1% (N=10) | 0±2% (N=5) |
| 0.03 nM | 1±2% (N=6) | 0±1% (N=9) |
| 0.1 nM | 11±7% (N=6) | 2±3% (N=2) |
| 0.3 nM | 43±21% (N=5) | 30±24% (N=20) |
| 1 nM | 81±26% (N=9) | 80±40% (N=16) |
| 3 nM | 88±50% (N=4) | 89±53% (N=20) |
| 10 nM | 75±25% (N=6) | 76±37% (N=17) |

**Somatic action potential (Figure 2)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **cell** | Ampl(mV)/width(µs) 0nM | Ampl(mV)/width(µs) 5nM | Ampl(mV)/width(µs) 10nM | Ampl(mV)/width(µs) 20nM |
| 1907b | 108.9 / 1000 | 108.8 / 1000 | 108.8 / 1050 | 109.2 / 1100 |
| 1907c | 111.5 / 1050 | 111.4 / 1050 | 111.5 / 1150 | 112.1 / 1150 |
| 2007a | 104.9 /1150 | 104.6 / 1200 | 104.8 / 1300 | 106.0 / 1400 |
| 2007b | 105.5 / 950 | 105.6 / 950 | 104.9 / 1050 | 108.6 / 1200 |
| 2007c | 102.5 / 900 | 102.7 / 900 | 102.8 / 950 | 106.6 / 1100 |
| 2007d | 104.1 / 750 | 106.1 / 800 | 105.6 / 850 | 105.7 / 1000 |
| 1503b | 112.7 / 1350 | 112.8 / 1400 | 116.6 / 1750 | 124.4 / 2000 |
| 1503c | 115.5 / 1250 | 115.6 / 1300 | 117.5 / 1450 | 121.5 / 1650 |

Ampl 0.13±0.81% 0.33±2.02% 2.80±3.94%

Width 2.34±2.65% 12.83±7.77%\* 25.41±12.75%\*

\* = p<0.01, paired ttest

**Somatic/axonal action potential (Figure 3)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **cell** | Soma AP width control (µs) | Soma AP width 7nM Aah-II (µs) | Axon AP width 7nM Aah-II (µs) | Axon AP width 7nM Aah-II (µs) |
| 2604b | 1200 | 1250 | 600 | 800 |
| 2804b | 850 | 900 | 650 | 750 |
| 2707a | 700 | 750 | 600 | 850 |
| 2707b | 1000 | 1150 | 550 | 800 |
| 2807a | 950 | 1100 | 700 | 950 |
| 2807b | 1050 | 1150 | 900 | 1150 |
| 2807c | 1050 | 1150 | 700 | 900 |
| 3107a | 1400 | 1850 | 1000 | 1700 |

Width soma 11.50±6.81%\* Width axon 37.24±16.13%\*

\* = p<0.01, paired ttest

**Sodium imaging (Figure 4AC)**

|  |  |  |
| --- | --- | --- |
| **cell** | **Sodium control (mM)** | **Sodium 7 nM Aah-II (mM)** |
| 03052023c | 0.75 | 1.41 (88%) |
| 03052023d | 0.96 | 1.38 (44%) |
| 27032023b | 0.80 | 1.55 (94%) |
| 30032023e | 1.42 | 2.33 (67%) |
| 30032023a | 0.64 | 1.42 (123%) |
| 29032023c | 1.05 | 1.65 (57%) |
| 05042023a | 0.75 | 1.62 (117%) |
| 05042023b | 0.73 | 1.53 (110%) |
| 05042023d | 1.04 | 2.02 (95%) |
|  | 0.90±0.24 | 1.65±0.32 (85.2±25.9%) p=1.07·10-6 paired ttest |

**Calcium imaging (Figure 4BC)**

|  |  |  |
| --- | --- | --- |
| **cell** | **Calcium control (ΔF/F0)** | **Calcium 7 nM Aah-II (ΔF/F0)** |
| 01082023e | 0.062 | 0.069 (11%) |
| 02082023c | 0.045 | 0.055 (22%) |
| 02082023g | 0.070 | 0.082 (17%) |
| 02082023e | 0.063 | 0.070 (11%) |
| 03082023a | 0.066 | 0.071 (8%) |
| 03082023b | 0.072 | 0.080 (10%) |
| 03082023d | 0.101 | 0.111 (10%) |
| 31072023c | 0.081 | 0.088 (9%) |
| 31072023e | 0.095 | 0.099 (4%) |
|  | 0.073±0.017 | 0.081±0.017 (11.1±5.3%) p=1.58·10-5 paired ttest |

**Calcium imaging (Figure 5)**

|  |  |  |
| --- | --- | --- |
| **cell** | **Control (ΔF/F0) dist-prox** | **7 nM Aah-II (ΔF/F0) dist-prox** |
| 01082023e | 0.039-0.071 | 0.046-0.072 |
| 02082023c | 0.041-0.058 | 0.052-0.059 |
| 02082023g | 0.060-0.079 | 0.085-0.074 |
| 02082023e | 0.054-0.066 | 0.063-0.066 |
| 03082023a | 0.040-0.066 | 0.043-0.068 |
| 03082023b | 0.061-0.077 | 0.070-0.075 |
| 03082023d | 0.099-0.102 | 0.118-0.105 |
| 31072023c | 0.071-0.103 | 0.081-0.101 |
| 31072023e | 0.073-0.088 | 0.080-0.089 |
|  | 0.060±0.020 - 0.079±0.016 | 0.071±0.024(18.7±10.3%) 0.079±0.016(0.0±3.0%) p=0.0011 – 0.8961 paired ttest |