

# Active dendrites regulate the impact of gliotransmission on rat hippocampal pyramidal neurons

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## DATASET: Figure-wise statistical analyses on data reported in this study

| Figure Number | Test used   | <i>n</i>  | Descriptive stats used  | <i>p</i> value  |
|---------------|---|---|---|---|
| 1C            | One-way ANOVA<br>Followed by unpaired <i>t</i> -test between groups | 61,26,37,26 and 79 events recorded from 5, 6,5(out of 7), 6(out of 9) and 6 (out of 8) neurons respectively | Independent data points   | ANOVA $2.6 \times 10^{-5}$<br>for unpaired <i>t</i> -test *<br>$p < 0.05$ , for ** $p < 0.005$      |
| 1E            | One-way ANOVA<br>followed by unpaired <i>t</i> -test between groups | 61,26,37,26 and 72 events recorded from 5, 6,5(out of 7), 6(out of 9) and 6 (out of 8) neurons respectively | Independent data points   | ANOVA, $p = 1.2 \times 10^{-6}$<br>for unpaired <i>t</i> -test *<br>$p < 0.05$ , for ** $p < 0.005$ |
| 1G            | One-way ANOVA<br>Followed by unpaired <i>t</i> -test between groups | 56,24,37,19 and 59 events recorded from 5, 6,5(out of 7), 6(out of 9) and 6 (out of 8) neurons respectively | Independent data points   | ANOVA, $p = 1.2 \times 10^{-3}$<br>for unpaired <i>t</i> -test *<br>$p < 0.05$ , for ** $p < 0.005$ |
| 2C            | Unpaired <i>t</i> -test   | 35, 13, 25 and 34 events recorded from 9, 7, 7 and 5 neurons respectively                                   | Independent data points with mean amplitudes<br>Soma: 2.3 (control), 3.58 (3,4-DAP)<br>Dend: 1.47 (control), 1.92 (3,4-DAP) | * $p = 0.008$ for dend  |
| 2D            | Unpaired <i>t</i> -test   | 35, 13, 25 and 34 events recorded from 9, 7, 7 and 5 neurons respectively                                   | Normalized cumulative histograms  | $p = 0.19$ (soma) and $0.008$ (dend)  |
| 2E            | Unpaired <i>t</i> -test   | 23,13, 25 and 34 events recorded from 9, 7, 7 and 5 neurons respectively                                    | Normalized cumulative histograms  | $p = 0.49$ (soma) and $0.67$ (dend)   |
| 2F            | Unpaired <i>t</i> -test   | 28, 14, 25 and 27 events recorded from 9, 7, 7 and 5 neurons respectively                                   | Normalized cumulative histograms  | $p = 0.47$ (soma) and $0.37$ (dend)   |
| 2G            | Mann-Whitney test   | SEP frequency recorded in 9,7,7,and 5 neurons, all from different brain slices                              | Median and quartile plots plots with medians as 0.82, 0.27, 0.09 and 0.27   | $p = 0.26$ (soma) and $0.41$ (dend)   |

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| 3C | Unpaired <i>t</i> -test  | 34,14,73 and 277 events recorded from 9, 6, 11 and 5 neurons respectively  | Independent data points with mean amplitudes<br>Soma: 2.3 (control), 2.797 (ZD7288)<br>Dend: 3.518 (control), 2.486 (ZD7288) | $p=0.67$ (soma) and 0.107 (dend)                 |
| 3D | Unpaired <i>t</i> -test  | 34,14,73 and 277 events recorded from 9, 6, 11 and 5 neurons respectively  | Normalized cumulative histogram  | $p=0.67$ (soma) and 0.19 (dend)                  |
| 3E | Unpaired <i>t</i> -test  | 23,12,71 and 277 events recorded from 9, 6, 11 and 5 neurons respectively  | Normalized cumulative histogram  | $p=0.45$ (soma) and $2.8 \times 10^{-11}$ (dend) |
| 3F | Unpaired <i>t</i> -test  | 28,25,57 and 209 events recorded from 9, 6, 11 and 5 neurons respectively  | Normalized cumulative histogram  | $p=0.42$ (soma) and $7 \times 10^{-9}$ (dend)    |
| 3G | Mann-Whitney-test        | 9,6 11 and 5 neurons , All from different brain sclices  | Median and quartile plots  | $p= 0.09$ (soma) and 0.0064 (dend)               |
| 4D | Paired <i>t</i> -test    | From 9, pairs (PRE and POST InsP <sub>3</sub> infusion into astrocyte) from 9 astrocyte-neuron paired recordings | Mean $\pm$ SEM<br>3.39 $\pm$ 1.06 (PRE) Vs 9.89 $\pm$ 1.57 (POST)  | $p= 0.014$                                       |
| 4E | Unpaired <i>t</i> -test  | 35 (PRE) and 696(POST) events from 9 astrocyte-neuron paired recordings  | Normalized cumulative histogram  | $p=0.92$   |
| 4F | Unpaired <i>t</i> -test  | 35 (PRE) and 693(POST) events from 9 astrocyte-neuron paired recordings  | Normalized cumulative histogram  | $p=0.238$  |
| 4G | Unpaired <i>t</i> -test  | 28 (PRE) and 143(POST) events from 8 astrocyte-neuron paired recordings  | Normalized cumulative histogram  | $p=0.75$   |
| 4H | Paired Mann-Whitney test | 9 PRE and 9 POST events from 9 astrocyte-neuron paired recordings  | independent data points and median 0.818 (PRE) and 1.81 (POST)   | $p=0.054$  |
| 4I | Paired Mann-Whitney test | 9 PRE and 9 POST events from 9 astrocyte-neuron paired recordings  | Independent data points and median 0.818 (PRE) and 2.459 (POST)  | $p=0.0039$                                       |

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| 5C | Unpaired <i>t</i> -test    | 43 (PRE) and 314 (POST) events from 7 neuron-astrocyte paired recordings  | Independent data points and mean 1.44 (PRE) and 2.14 (POST)                       | $p=2.6\times 10^{-4}$ |
| 5D | Paired <i>t</i> -test      | From 7, pairs (PRE and POST InsP <sub>3</sub> infusion into distal astrocyte) from 7 astrocyte-neuron paired recordings   | Mean $\pm$ SEM<br>1.93516 $\pm$ 0.809056 (PRE)<br>Vs 8.41427 $\pm$ 2.63463 (POST) | $p= 0.07$             |
| 5E | Paired Mann-Whitney test   | 7 PRE and 7 POST events from 7 astrocyte-neuron paired recordings   | Independent data points and median 0.545554 (PRE) and 2.59138 (POST)              | $p=0.156$             |
| 5F | Paired Mann-Whitney test   | 7 PRE and 7 POST events from 7 astrocyte-neuron paired recordings   | Independent data points and median 0.545554 (PRE) and 2.72777 (POST)              | $p=0.078$             |
| 5G | Same as Figure 5C          | Data same as Figure 5C  | Normalized cumulative histogram   | $p=2.6\times 10^{-4}$ |
| 5H | Unpaired <i>t</i> -test    | 43 (PRE) and 314 (POST) events from 7 astrocyte-neuron paired recordings  | Normalized cumulative histogram   | $p=3.3\times 10^{-6}$ |
| 5I | Unpaired <i>t</i> -test    | 43 (PRE) and 296 (POST) events from 7 neuron-astrocyte paired recordings  | Normalized cumulative histogram   | $p=0.5$               |
| 5J | Unpaired <i>t</i> -test    | 696 (PROX) and 314 (DIST) events recorded post infusion of InsP <sub>3</sub> infusion, into proximal and distal astrocytes respectively, for paired astrocyte-neuron recordings | Independent data points, and mean: PROX= 2.13, DIST=2.33                          | $p= 0.16$             |
| 5K | Unpaired Mann-Whitney test | 9 (PROX) and 7 (DIST) events from 9 and 7 neurons respectively  | Independent data points along with median values 8.75397 (PROX), 6.89438 (DIST)   | $p=0.54$              |
| 5L | Unpaired Mann-Whitney test | 9 and 7 events from 9 and 7 neurons respectively  | Independent data points and median: PROX=1.81, DIST=2.59                          | $p=1$                 |

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| 5M | Unpaired Mann-Whitney test | 9 and 7 events from 9 and 7 neurons respectively  | Independent data points and median: PROX=2.46, DIST=2.72                         | $p=0.95$               |
| 5N | Unpaired <i>t</i> -test    | 696 (PROX) and 314 (DIST) events recorded post infusion of InsP <sub>3</sub> infusion, into proximal and distal astrocytes respectively, for paired astrocyte-neuron recordings | Independent data points and mean: PROX= 23.39, DIST=31.66                        | $p=3.6 \times 10^{-6}$ |
| 5O | Unpaired <i>t</i> -test    | 143 (PROX) and 296 (DIST) events recorded post infusion of InsP <sub>3</sub> infusion, into proximal and distal astrocytes respectively, for paired astrocyte-neuron recordings | Independent data points and mean: PROX=102.16, DIST=140.26                       | $p=0.034$              |
| 6C | Unpaired <i>t</i> -test    | 696 (Control) and 62 (3,4-DAP) events from 9 and 7 neuron-astrocyte paired recordings respectively  | Independent data points plotted and mean 2.338 (control), 4.576 (3,4DAP)         | $p=0.0087$             |
| 6D | Unpaired <i>t</i> -test    | 693 (Control) and 60 (3,4-DAP) events from 9 and 7 neuron-astrocyte paired recordings respectively  | Independent data points plotted and mean 23.3934 (control) and 21.7986 (3,4-DAP) | $p=0.36$               |
| 6E | Unpaired <i>t</i> -test    | 143 (control) and 50 (3,4-DAP) events from 8 (control) and 7 (3,4-DAP) neuron-astrocyte paired recordings respectively  | Independent data points plotted  | $p=0.1803$             |

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| 6F | Unpaired Mann-Whitney test                   | 9 (control) and 7 (DAP) from 9 and 7 paired neuron -astrocyte recordings                                      | Independent data points along with median values 1.81 (control) and 0.600109 (3,4-DAP)                                  | $p=0.022$  |
| 6I | Unpaired $t$ -test                           | 696 (Control) and 154 (ZD) events from 9 (control) and 5 (ZD) neuron-astrocyte paired recordings respectively | Independent data points and mean 2.338 (control), 3.38423 (ZD7288)  | $p=0.007$  |
| 6J | Unpaired $t$ -test                           | 693 (Control) and 154 (ZD) events from 9 (control) and 5 (ZD) neuron-astrocyte paired recordings respectively | Independent data points and mean mean 23.3934 (control) and 39.6235 (ZD7288)  | $p=1.4 \times 10^{-6}$   |
| 6K | Unpaired $t$ -test                           | 143 (control) and 114 (ZD) from 8 (control) and 5 (ZD) neuron-astrocyte paired recordings respectively        | Independent data points   | $p=0.0015$   |
| 6L | Unpaired $t$ -test                           | 9 (control) and 5 (ZD) from 9 and 5 paired neuron-astrocyte recordings respectively                           | Independent data points and median values 1.81 (control) 2.45459 (ZD7288)   | $p=0.89$   |
| 7C | One-way ANOVA followed by unpaired $t$ -test | 696,71,63 and 38 events from 9,7,6 and 7 paired neuron-astrocyte recordings respectively                      | Independent data points along with respective mean values 2.33829 (control) 3.05299 (DQP) 1.85166 (IFN) 2.42265 (IFNDQ) | for ANOVA $p=0.003$<br>for $t$ -test<br>* $p<0.05$ ,<br>** $p<0.005$ |
| 7D | One-way ANOVA followed by unpaired $t$ -test | 9,7,6,and 7 events from 9,7,6 and 7 paired neuron-astrocyte recordings respectively                           | Mean $\pm$ SEM<br>9.8 $\pm$ 1.5 (control), 9.2 $\pm$ 2.9 (DQP), 5.1 $\pm$ 1.3 (IFN), 3.2 $\pm$ 1.1 (IFNDQ)              | ANOVA $p=0.053$<br>for $t$ -test<br>* $p<0.05$ ,<br>** $p<0.005$     |

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| 7F   | One-way ANOVA followed by unpaired <i>t</i> -test         | 693,71,63 and 38 events from 9,7,6 and 7 paired neuron-astrocyte recordings respectively | Normalized cumulative histogram  | ANOVA $p=0.02$ for <i>t</i> -test<br>* $p<0.05$ ,<br>** $p<0.005$  |
| 7G   | One-way ANOVA   | 143,55,53 and 33 events from 9,7,6 and 7 paired neuron-astrocyte recordings respectively | Normalized cumulative histograms   | ANOVA $p=0.13$   |
| 7H   | Kruskal-Wallis followed by unpaired Mann-Whitney test     | 9,7,6, and 7 events from 9,7,6 and 7 paired neuron-astrocyte recordings respectively     | Independent data points along with respective median values<br>1.81 (control) 0.272727 (DQP) 0.681818 (IFN) 0.363636 (IFNDQ) | KW $p=0.0197$ for Mann-Whitney<br>* $p<0.05$ ,<br>** $p<0.005$   |
| 8F   | Unpaired <i>t</i> -test                                   | 10 (control), 10 (-HCN) and 10 (-KA) events from 10 epochs of simulation                 | Mean±SEM<br>72.5 ± 1.5 (Baseline), 79.3 ± 0.47 (-HCN) and 103.9 ± 0.72(-KA)  | $p=0.0012$ (-HCN) and $8\times 10^{-11}$ (-KA)   |
| 8H   | One-way ANOVA followed by paired Student's <i>t</i> -test | 119 each for Control, -HCN, -KA, Passive groups.   | Mean ± SEM:<br>Baseline: 198 ± 1.8<br>-HCN: 213 ± 1.9<br>-KA: 262 ± 2.3<br>Passive: 394 ± 1.8                                | ANOVA: $2\times 10^{-16}$<br><i>t</i> -test:<br>Baseline vs. -KA: $1\times 10^{-34}$<br>Baseline vs. -HCN: $5\times 10^{-77}$<br>Baseline vs. -KA-HCN: $2\times 10^{-114}$<br>-KA vs. -HCN: $2\times 10^{-92}$<br>-KA vs. Passive: $2\times 10^{-92}$<br>-HCN vs. Passive: $3\times 10^{-116}$ |
| S2 C | Paired Student's <i>t</i> -test                           | 62 pairs values from simultaneous somato-dendritic recordings from 6 neurons             | Independent data points with along with mean values: 2.14796 (dend) 2.60818 (soma)   | $p=0.036$  |

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| S2 D | Unpaired Mann-Whitney test      | Ratio of 680 (simulation) and 62 (experiments) events   | Median and quartile plots  | $p=0.56$   |
| S2 E | Paired Student's <i>t</i> -test | 62 pairs values from simultaneous somato-dendritic recordings from 6 neurons  | Independent datapoints along with mean values<br>36.91 (dend)<br>33.26 (soma)  | $p=0.1165$   |
| S2 F | Paired Student's <i>t</i> -test | 62 pairs values from simultaneous somato-dendritic recordings from 6 neurons  | Independent datapoints along with mean values<br>127.346 (dend)<br>138.645 (soma)  | $p= 0.012s$  |
| S2 H | Student's <i>t</i> -test        | 62 and 51 events for soma and 26 and 38 events for dendrite ,respectively, for the recording conditions indicated in the figure | Independent data points with population mean values<br>Soma (single) 1.88527 mV<br>soma (dual) 2.96063 mV<br>dend(single) 4.66306 mV<br>dend (dual)2.97887 mV  | $p=0.223$ for somayic and $0.278$ for dendritic comparison, respectively |
| S2 I | Student's <i>t</i> -test        | 62 and 51 events for soma and 26 and 38 events for dendrite, respectively, for the recording conditions indicated in the figure | Independent data points with population mean values<br>Soma (single) 34.9781 ms<br>soma (dual) 32.9322 ms<br>dend(single) 28.9617 ms<br>dend (dual) 39.7725 ms | $p=0.768$ for somayic and $0.294$ for dendritic comparison, respectively |

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| S2 J | Student's <i>t</i> -test   | 39 and 48 events for soma and 19 and 36 events for dendrite, respectively, for the recording conditions indicated in the figure | Independent data points with population mean values<br>Soma (single) 92.7143 ms<br>soma (dual) 172.1 ms<br>dend(single) 125.009 ms<br>dend (dual) 143.967 ms | $p=0.046$ for somayic and 0.78 for dendritic comparison, respectively |
| S3 B | Unpaired <i>t</i> -test    | 61 (SPONT) and 34 (APV) recorded from 5 and 6 neurons respectively  | Independent data points along with mean values<br>1.88528 (SPONT)<br>1.37775 (APV)   | $p=0.005$   |
| S3 C | Unpaired <i>t</i> -test    | 61 (SPONT) and 34 (APV) recorded from 5 and 6 neurons respectively  | Independent data points along with mean values<br>34.9781 (SPONT)<br>15.5187 (APV)   | $p=0.0002$  |
| S3 D | Unpaired <i>t</i> -test    | 39 (SPONT) and 31 (APV) recorded from 5 and 6 neurons respectively  | Independent data points along with mean values<br>92.7143 (SPONT),<br>92.4494 (APV)  | $p=0.98$  |
| S3 E | Unpaired Mann-Whitney test | 5 (SPONT) and 6 (APV) neurons   | Independent data points along with median values<br>2.31819(SPONT),<br>0.636375 (APV)  | $p=0.0497$  |
| S4 B | Unpaired <i>t</i> -test    | 61 (SPONT) and 53 (BAPTA) recorded from 5 and 6 neurons respectively  | Independent data points along with mean values<br>1.88528 (SPONT)<br>1.69667 (BAPTA)   | $p=0.3$   |
| S4 C | Unpaired <i>t</i> -test    | 61 (SPONT) and 53 (BAPTA) recorded from 5 and 6 neurons respectively  | Independent data points along with mean values<br>34.9781 (SPONT)<br>23.9353 (BAPTA)   | $p=0.04$  |



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| S4 D | Unpaired <i>t</i> -test    | 39 (SPONT) and 49 (BAPTA) recorded from 5 and 6 neurons respectively | Independent data points along with mean values 92.7143 (SPONT), 91.7285 (BAPTA)      | $p=0.9$     |
| S4 E | Unpaired Mann-Whitney test | 5 (SPONT) and 7 (BAPTA) neurons                                      | Independent data points along with median values 2.31819(SPONT), 0.545465 (BAPTA)    | $p=0.07$    |
| S5 E | Unpaired <i>t</i> -test    | 61(SPONT) and 696 (POST) events from 5 and 9 neurons respectively    | Mean $\pm$ SEM<br>1.88527 $\pm$ 0.15 (SPONT) and 2.34 $\pm$ 0.064(POST) respectively | $p=0.007$   |
| S5 F | Unpaired <i>t</i> -test    | 61(SPONT) and 693 (POST) events from 5 and 9 neurons respectively    | Mean $\pm$ SEM<br>34.98 $\pm$ 4.69 (SPONT) and 23.39 $\pm$ 0.62 (POST)               | $p=0.0172$  |
| S5 G | Unpaired <i>t</i> -test    | 39 (Spont) and 143 (Post) events from 5 and 9 neurons respectively   | Mean $\pm$ SEM<br>92.7 $\pm$ 11.6 (spont) and 102.1 $\pm$ 7.1 (post)                 | $p=0.49$    |
| S5 H | Unpaired Mann-Whitney test | 5 and 9 neurons  | Mean $\pm$ SEM<br>2.5 $\pm$ 0.76 (SPONT)<br>9.3 $\pm$ 7.5 (POST)                     | $p=0.79$    |
| S5 I | Unpaired Mann-Whitney test | 5 and 9 neurons  | Mean $\pm$ SEM<br>2.9 $\pm$ 0.9 (SPONT)<br>14.7 $\pm$ 11.9 (POST)                    | $p=1$       |
| S6 C | Unpaired <i>t</i> -test    | 81 (PRE) and 158 (POST) events from 5 neurons                        | Normalized cumulative histogram  | $p=0.29$    |
| S6 D | Paired Mann-Whitney test   | 5 (PRE) and 5 (POST) neurons   | Independent data points  | $p= 0.4375$ |

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| S7 D | Unpaired <i>t</i> -test  | 9 (Control) and 7 (DAP) events from 9 and 7 neurons respectively                   | Mean $\pm$ SEM<br>9.8 $\pm$ 1.5 (PRE)<br>17.5 $\pm$ 4.4(POST)                         | <i>p</i> =0.14   |
| S7F  | Unpaired <i>t</i> -test  | 13(PRE) and 60(POST) events from 7 neurons   | Normalized cumulative histogram   | <i>p</i> =0.34   |
| S7 H | Unpaired <i>t</i> -test  | 13 (pre) and 50 (post) events from 7 neurons                                       | Normalized cumulative histogram   | <i>p</i> =0.71   |
| S7 J | Paired Mann-Whitney test | 7 events from 7 neurons  | Independent data points along with median values<br>0.272777 (PRE)<br>0.600109 (POST) | <i>p</i> =0.38   |
| S7 K | Paired Mann-Whitney test | 7 events from 7 neurons  | Independent data points along with median values<br>0.272777 (PRE)<br>1.0929 (POST)   | <i>p</i> =0.03   |
| S8 C | Unpaired <i>t</i> -test  | 14 (preInsP <sub>3</sub> ) and 154 (post InsP <sub>3</sub> ) events from 5 neurons | Normalized cumulative histogram   | <i>p</i> =0.6    |
| S8 D | Unpaired <i>t</i> -test  | 9 (control) and 5(ZD7288) events from 9 and 5 neurons respectively                 | Mean $\pm$ SEM<br>9.8 $\pm$ 1.5<br>18.4 $\pm$ 5.07                                    | <i>p</i> =0.17   |
| S8 F | Unpaired <i>t</i> -test  | 12 (preInsP <sub>3</sub> ) and 154(post InsP <sub>3</sub> ) events from 5 neurons  | Normalized cumulative histogram   | <i>p</i> =0.063  |
| S8 H | Unpaired <i>t</i> -test  | 25 (pre) and 114(post) events from 5 neurons                                       | Normalized cumulative histogram   | <i>p</i> =0.014  |
| S8 J | Paired Mann-Whitney test | 5 events (pre and Post) from 5 neurons   | Independent data points along with median values<br>0.272728 (PRE),<br>2.45459 (POST) | <i>p</i> =0.0625 |

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| S8 K | Paired Mann-Whitney test | 5 events (pre and Post) from 5 neurons       | Independent data points along with median values<br>0.272728 (PRE) 3.27332 (POST)                | $p=0.0625$ |
| S9 A | Unpaired $t$ -test       | 29 (PRE) and 71 (Post) events from 7 neurons | Normalized cumulative histogram  | $p=0.65$   |
| S9 B | Unpaired $t$ -test       | 10 (Pre) and 63(Post) events from 6 neurons  | Normalized cumulative histogram  | $p=0.58$   |
| S9 C | Unpaired $t$ -test       | 10 (Pre) and 38(Post) events from 7 neurons  | Normalized cumulative histogram  | $p=0.0004$ |
| S9 E | Paired Mann-Whitney test | 7 pre and 7 post events from 7 neurons       | Independent data points along with respective median values<br>0.727405 (PRE)<br>0.272727 (POST) | $p=0.94$   |
| S9 F | Paired Mann-Whitney test | 6 pre and 6 post events from 7 neurons       | Independent data points along with respective median values<br>0.545554 (PRE)<br>0.681818 (POST) | $p=0.4375$ |
| S9G  | Paired Mann-Whitney test | 7 pre and 7 post events from 7 neurons       | Independent data points along with respective median values<br>0 (PRE)<br>0.363636 (POST)        | $p=0.8339$ |
| S9 H | Unpaired $t$ -test       | 27 (pre) and 71 (post) events from 7 neurons | Normalized cumulative histogram  | $p=0.97$   |
| S9 I | Unpaired $t$ -test       | 10 (pre) and 63 (post) events from 6 neurons | Normalized cumulative histogram  | $p=0.37$   |
| S9 J | Unpaired $t$ -test       | 10 (Pre) and 38(Post) events from 7 neurons  | Normalized cumulative histogram  | $p=0.048$  |