**Supplemental Tables**

Supplemental Table 1. Linear regression results for group differences across injuries.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | β | *t* | *p* |
| Overall | Group | -0.50 | -2.14 | **0.041** |
|  | Injury # | 0.03 | 1.02 | 0.307 |
|  | Group\*Injury # | -0.33 | -8.37 | **<0.001** |
| Injury1 | Group | -0.31 | -1.03 | 0.312 |
|  | Session | -0.08 | -1.30 | 0.196 |
|  | Group\*Session | 0.18 | 2.49 | **0.013** |
| Injury2 | Group | -0.53 | -1.47 | 0.154 |
|  | Session | -0.14 | -2.36 | **0.019** |
|  | Group\*Session | 0.13 | 1.72 | 0.087 |
| Injury3 | Group | -0.52 | -1.68 | 0.105 |
|  | Session | -0.09 | -1.60 | 0.111 |
|  | Group\*Session | 0.10 | 1.34 | 0.183 |
| Injury4 | Group | -0.79 | -2.77 | **0.010** |
|  | Session | 0.03 | 0.41 | 0.685 |
|  | Group\*Session | 0.08 | 1.01 | 0.315 |
| Injury5 | Group | -0.69 | -2.61 | **0.015** |
|  | Session | -0.10 | -1.45 | 0.148 |
|  | Group\*Session | 0.14 | 1.54 | 0.126 |

Supplemental Table 2. Piecewise regression results for within-subjects effects change after each injury (relative to prior injury).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Sham | | | CHIMERA | | |
|  | β | *t* | *p* | β | *t* | *P* |
| Intercept | -0.78 | -2.06 | **0.042** | 0.77 | 3.00 | **0.003** |
| Time | 0.67 | 1.12 | 0.261 | 0.10 | 0.25 | 0.801 |
| Injury1 | 0.22 | 1.01 | 0.315 | -0.44 | -2.77 | **0.006** |
| Injury1 Slope | -1.12 | -1.58 | 0.114 | 0.47 | 0.95 | 0.341 |
| Injury2 | 0.41 | 1.91 | 0.056 | -0.36 | -2.27 | **0.023** |
| Injury2 Slope | -0.34 | -0.70 | 0.485 | -0.44 | -1.24 | 0.216 |
| Injury3 | 0.44 | 2.07 | **0.039** | -0.24 | -1.42 | 0.157 |
| Injury3 Slope | 0.14 | 0.38 | 0.704 | 0.00 | 0.00 | 1.000 |
| Injury4 | 0.19 | 0.87 | 0.385 | -0.45 | -2.59 | **0.010** |
| Injury4 Slope | 0.30 | 1.31 | 0.190 | 0.21 | 1.23 | 0.218 |
| Injury5 | 0.14 | 0.64 | 0.524 | -0.13 | -0.72 | 0.472 |
| Injury5 Slope | -0.11 | -1.17 | 0.241 | -0.07 | -0.96 | 0.340 |

Supplemental Table 3: Correlations between DDT performance and neuropathology

|  |  |
| --- | --- |
|  | Pearson’s coefficients:  DDT performance and neuropathological outcomes |
| DAT:TH  Olfactory Tubercle | r = 0.08428  p = 0.7652 |
| Iba1  Corpus Callosum | r = -0.4751  p = 0.0629 |
| Iba1  Optic Tract | r = -0.2969  p = 0.2641 |
| Iba1  Olfactory Tubercle | r = 0.3165  p = 0.2323 |
| GFAP  Corpus Callosum | r = 0.1975  p = 0.4635 |
| Silver  Optic Tract | r = -0.4859  p = 0.0563 |

Supplemental Table 4: Biochemical measurement of tau and inflammatory cytokines in fore and mid-brain RIPA lysates following repetitive CHIMERA injury.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Forebrain | | | Midbrain | | |
| Analyte | Sham (n=11) | TBI (n=16) | p-value | Sham (n=11) | TBI (n=16) | p-value |
| Total tau (ng/mg) | 4297 ± 190 | 4843 ± 190 | 0.0613 | 4740 ± 248 | 5155 ± 139 | 0.1298 |
| P-tau (unit/mg) | 242.3 ± 12.2 | 258.2 ± 10.5 | 0.3357 | 304.6 ± 17.2 | 335.8 ± 11.6 | 0.1299 |
| Ratio p:total tau (unit/ng) | 0.0563 ± 0.00147 | 0.0535 ± 0.00140 | 0.1892 | 0.0646 ± 0.00233 | 0.0653 ± 0.00175 | 0.8174 |
| IL-1β (pg/mg) | 11.0 ± 0.566 | 10.8 ± 0.492 | 0.7453 | 6.49 ± 0.300 | 7.15 ± 0.314 | 0.1588 |
| IL-6 (pg/mg) | 53.4 ± 1.94 | 54.9 ± 1.86 | 0.5983 | 45.0 ± 1.38 | 45.7 ± 1.34 | 0.7108 |
| TNFα (pg/mg) | 0.130 ± 0.0133 | 0.152 ± 0.0179 | 0.3695 | 0.0677 ± 0.00481 | 0.0748 ± 0.00387 | 0.2586 |