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| **Statistical Comparisons** **for Figure 3** | **Comparison** | **Result** |
| **Panel** | **Description**  | **Test** | **p value** | **n value** |
| **3A** | Normalized change in amplitude of spine events for visual spinesControl vs Deprived | *Two-Way ANOVA with post-hoc test* | Amplitude: Control vs Deprived | p = 0.004 | DeprivedVisual =112 spinesControlVisual = 143 spinesDeprived Unclassified = 41 spinesControlUnclassified = 75 spinesDeprivedNetwork = 273 spinesControlNetwork = 428 spines |
| -24 hrs: Con vs Dep | p = 0.733 |
|  -1 hrs: Con vs Dep | p = 0.733 |
| +12 hrs: Con vs Dep | p < 0.001 |
| +24 hrs: Con vs Dep | p = 0.465 |
| +48 hrs: Con vs Dep | p = 0.016 |
| *One-Way**Repeated measures ANOVA* | Amplitude: Dep -1 hrs vs Dep 12,24,48 hrs  | p = 0.152 |
| Amplitude: Con -1 hrs vs Con 12,24,48 hrs | p = 0.166 |
| **3B** | Normalized change in amplitude of spine events for unclassifiedspinesControl vs Deprived | *Two-Way ANOVA with post-hoc test* | Amplitude: Control vs Deprived | p = 0.557 |
| -24 hrs: Con vs Dep | p = 0.373 |
|  -1 hrs: Con vs Dep | p = 0.373 |
| +12 hrs: Con vs Dep | p = 0.197 |
| +24 hrs: Con vs Dep | p = 0.806 |
| +48 hrs: Con vs Dep | p = 0.835 |
| *One-Way**Repeated measures ANOVA* | Amplitude: Dep -1 hrs vs Dep 12,24,48 hrs  | p = 0.683 |
| Amplitude: Con -1 hrs vs Con 12,24,48 hrs | p = 0.558 |
| **3C** | Normalized change in amplitude of spine events for network spinesControl vs Deprived | *Two-Way ANOVA with post-hoc test* | Amplitude: Control vs Deprived | p < 0.001 |
| -24 hrs: Con vs Dep | p = 0.841 |
| -1 hrs: Con vs Dep | p = 0.841 |
| +12 hrs: Con vs Dep | p = 0.505 |
| +24 hrs: Con vs Dep | p < 0.001 |
| +48 hrs: Con vs Dep | p < 0.001 |
| *One-Way**Repeated measures ANOVA* | Amplitude: Dep -1 hrs vs Dep 12,24,48 hrs | p = 0.008 |
| Dep -1 hrs vs +12 hrs | p = 0.556 |
| Dep -1 hrs vs +24 hrs | p = 0.015 |
| Dep -1 hrs vs +48 hrs | p = 0.045 |
| Amplitude: Con -1 hrs vs Con 12,24,48 hrs | p = 0.122 |
| **3D** | % of inactive visual spinesCon vs Dep | *Chi-square**test* | +12 hrs: Con (0.7 %) vs Dep (30.4%)+24 hrs: Con (0.7 %) vs Dep (16.1 %) +48 hrs: Con (1.4 %) vs Dep (16.1 %) | p < 0.001p < 0.001p < 0.001 |
| **3E** | % of inactive unclassified spinesCon vs Dep | *Chi-square**test* | +12 hrs: Con (1.3 %) vs Dep (14.6%)+24 hrs: Con (5.3 %) vs Dep (14.6 %)+48 hrs: Con (2.7 %) vs Dep (4.9 %)  | p = 0.024p = 0.228p = 0.951 |
| **3F** | % of inactive network spinesCon vs Dep | *Chi-square**test* | +12 hrs: Con (0.2 %) vs Dep (14.7%) +24 hrs: Con (3.0 %) vs Dep (10.3 %) +48 hrs: Con (1.4 %) vs Dep (7.3 %) | p < 0.001p = 0.052p < 0.001 |
| **3G** | Correlation normalized frequency and amplitude | *Pearson correlation*  | Visual spines (r = -0.014) | p = 0.969 |
| **3H** | Unclassified spines (r = 0.051) | p = 0.897 |
| **3I** | Network spines (r = 0.215) | p = 0.551 |

**Figure 3-source data 1.** Statistical comparisons for Figure 3.