**Supplementary File 3.**

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| **Behavioral context** | **Watson’s test** | **Left-right FL** | **Left-right HL** | **Contra HL-FL** |
| Overground locomotion | U2 | 0.6720 | 1.4458 | -0.3594 |
| p-value | **\*\*\*p<0.001** | **\*\*\*p<0.001** | p>0.5 |
| Treadmill locomotion | U2 | 0.0688 | 0.1513 | 0.0984 |
| p-value | p>0.5 | 0.10<p<0.20 | 0.2<p<0.5 |
| Exploratory-like locomotion | U2 | 0.1095 | -0.0307 | 0.1629 |
| p-value | 0.2<p<0.5 | p>0.5 | 0.05<p<0.10 |
| Overground locomotion on Sylgard coated surface | U2 | 0.2791 | 0.6128 | 0.3393 |
| p-value | **\*\*0.005<p<0.01** | **\*\*\*p<0.001** | **\*\*0.002<p<0.005** |
| Overground locomotion on uncoated acrylic surface | U2 | -0.0655 | 0.0914 | 0.0542 |
| p-value | p>0.5 | 0.2<p<0.5 | p>0.5 |
| Overground locomotion, Sylgard coated vs uncoated acrylic (comparing control time points) | U2 | -0.5710 | 0.0600 | 0.0767 |
| p-value | p>0.5 | p>0.5 | 0.2<p<0.5 |
| Overground locomotion, Sylgard coated vs uncoated acrylic (comparing DoxOn time points) | U2 | 0.4412 | 0.4918 | 0.4496 |
| p-value | **\*\*\*p<0.001** | **\*\*\*p<0.001** | **\*\*\*p<0.001** |
| Swimming | U2 | - | -24.1670 | - |
| p-value | - | p>0.5 | - |