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## Supplemental information

# Mechanosensory signal transmission in the arms and the nerve ring, an interarm connective, of *Octopus bimaculoides*

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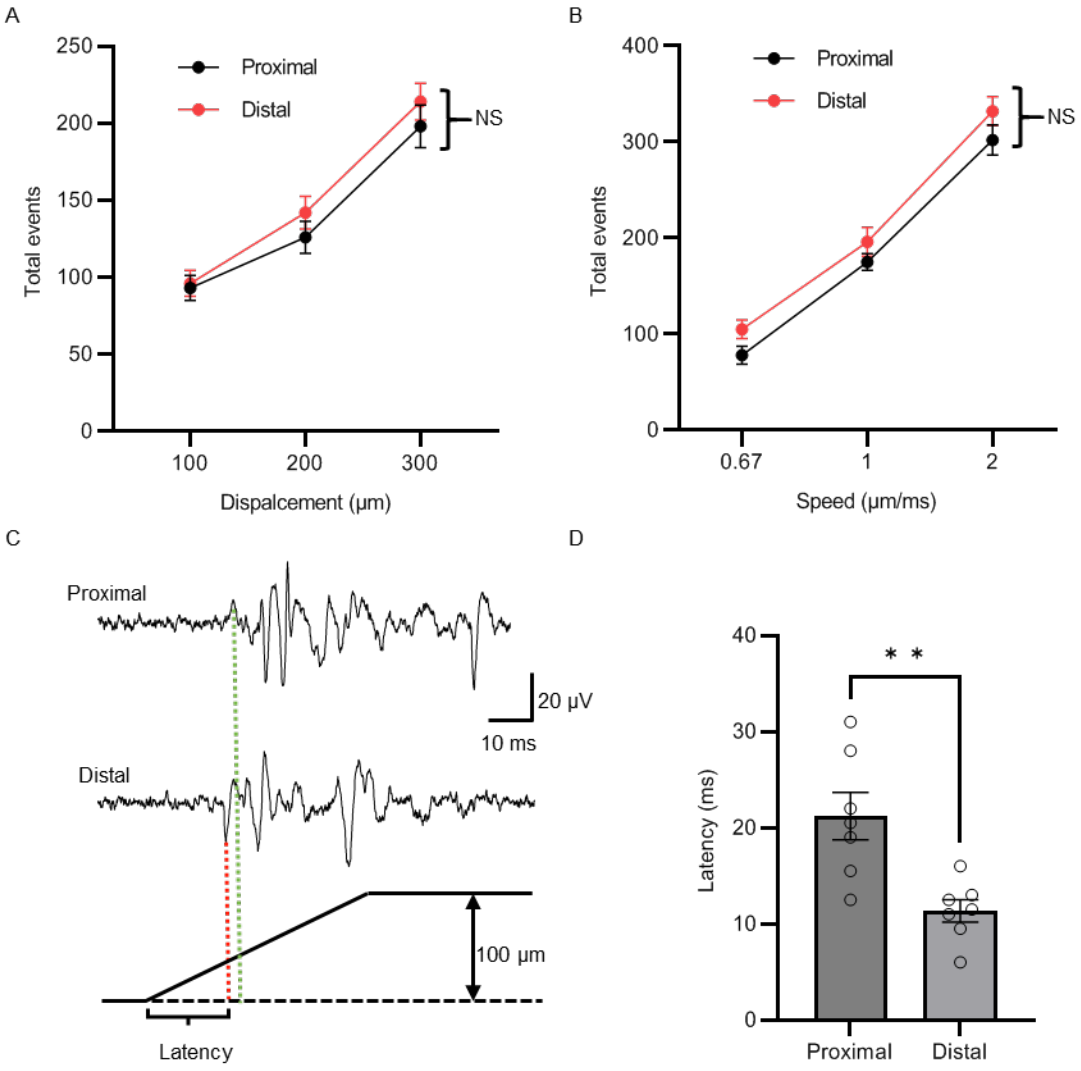


Figure S1. Comparison between responses to proximal and distal mechanical stimulation of the axial nerve cord. Related to Figure 1. There was no significant difference in the axial nerve cord activity, measured as total events, between the two stimulation groups at any indentation magnitude (A) or stimulation speed (B). (C&D) Analysis of delay showed that distal stimulation resulted in a significantly shorter delay than proximal stimulation (N=7 animals, 5 trails per animal). Data represent the mean ± SEM; two-way ANOVA with Bonferroni post hoc tests.

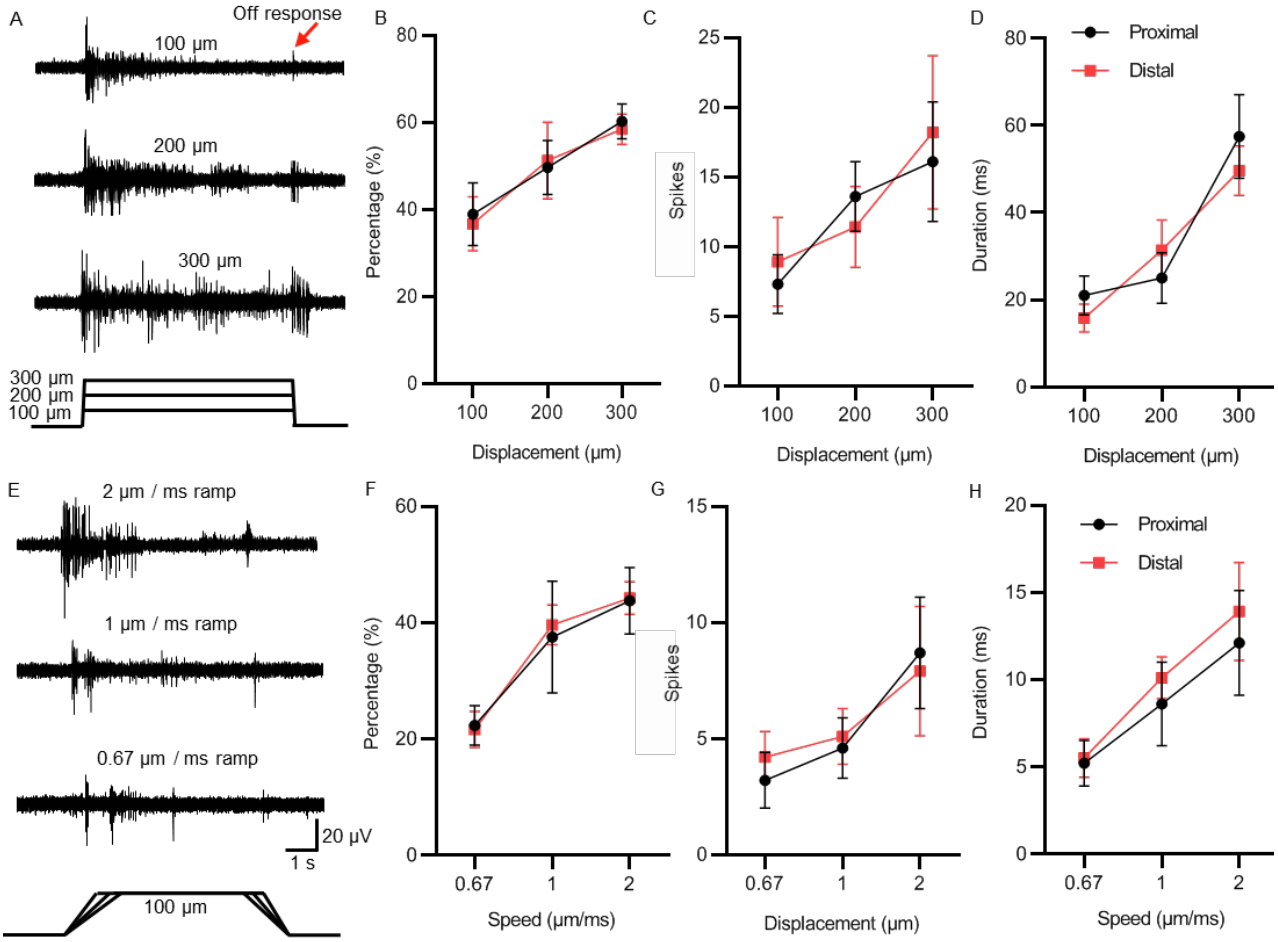


Figure S2 Analysis of the off responses, related to Figure 1. (A) Typical off responses induced by different amplitudes of arm indentation proximal to the recording site. (B) No significant difference in the off response was observed between proximal and distal stimulations. However, a 300 µm displacement in the distal stimulation group was more likely to induce off responses. (C) There was no significant differences in spike numbers of off response between proximal and distal stimulations. However, a 300 µm displacement in the distal stimulation group induced more spikes. (D) No significant differences in the duration of the off response were observed between proximal and distal stimulations. However, a 200 or 300 µm displacement in the proximal group and a 300 µm displacement in the distal group induce longer durations. (E) Typical off responses induced by different proximal arm indentation speeds. (F) There was no significant difference in the off response between proximal and distal stimulations. However, a 2 µm/ms stimulation speed in both groups is more likely to induce an off response. (G) No significant difference in the spike numbers in the off response was observed between proximal and distal stimulations. (H) There was no significant difference in the duration of the off response between proximal and distal stimulations. However, a 2 µm/ms stimulation speed in the distal group induced a longer duration. N=7 animals, 5 trials per animal. Data are presented as mean ± SEM; analyzed using two-way ANOVA with Bonferroni post-hoc tests.

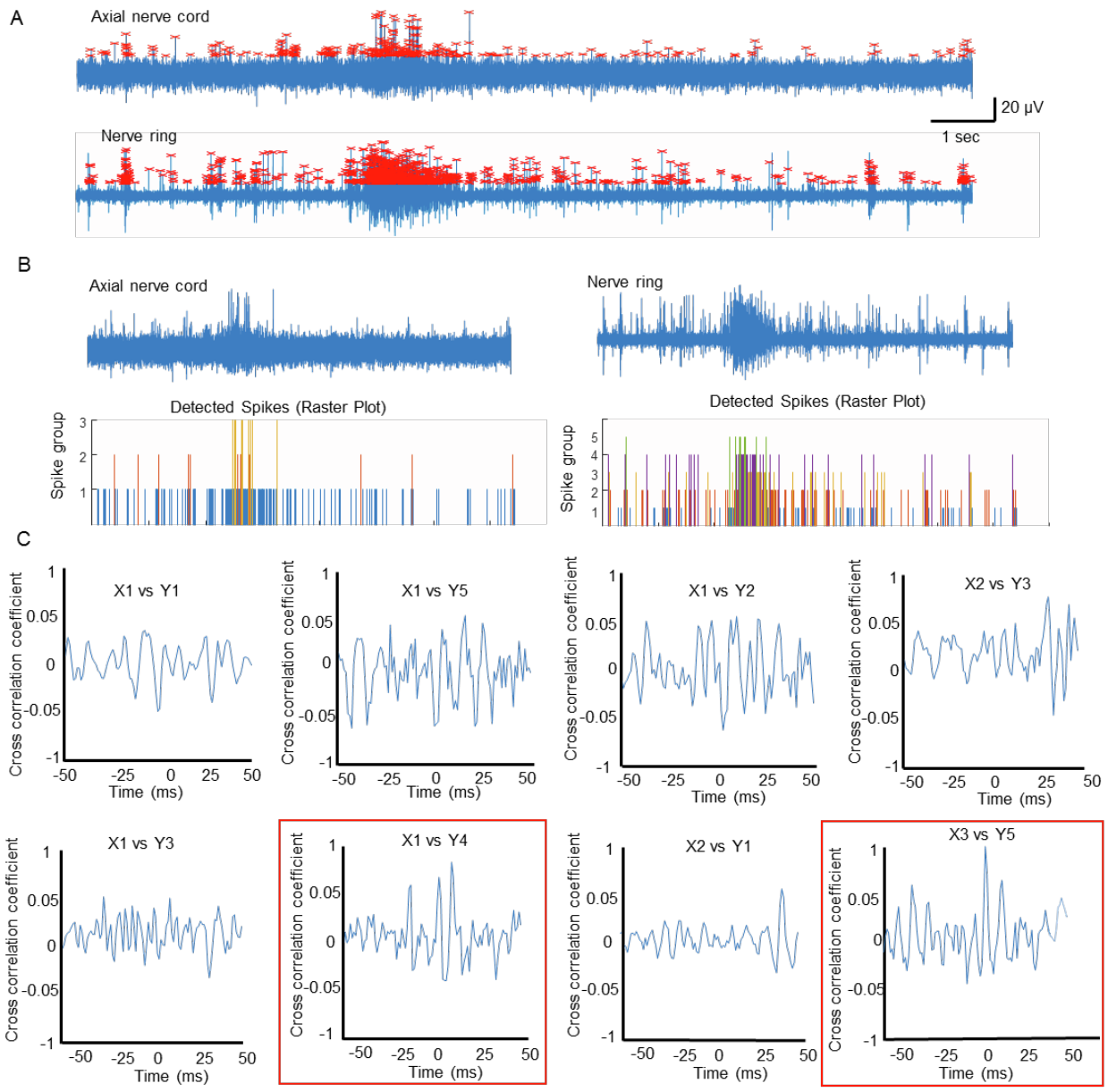


Figure S3. Spike sorting and correlation between axial nerve cord and nerve ring activity, related to Figure 5. (A) Spikes were detected using a threshold of 5 times the standard deviation of background noise being detected. (B) Spike sorting from the axial nerve cord recording resulted in three groups (x1-x3), while spikes from the nerve ring recording were sorted into five groups (y1-y5). (C) Spike correlations were calculated using a ±50ms time window for the axial nerve cord spikes. We found that group 1 spikes of the axial nerve cord had a high correlation coefficient with group 4 spikes from the nerve ring, while group 3 spikes of the axial nerve cord spikes had a high correlation coefficient with group 5 spikes from the nerve ring.