Electronic Supplementary Material (ESI) for Lab on a Chip.

Supplementary Information

Surface acoustic waves enable rotational manipulation of *Caenorhabditis elegans*

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Safety test experiment

To demonstrate the safety of surface acoustic waves to the worms, we compared the movement and reproduction ability of worms with or without treatment by surface acoustic waves. Here, treatment means letting the worms stay in the acoustic field for 4 seconds (3 seconds was the maximum rotation period in our experiment) while a RF signal of power 31.2 V_{pp} (the maximum power we used in our experiment) was applied to IDTs on one side. Simultaneously, we investigated the biological effect of paralysis with sodium azide (10 mM). The worms were first divided into four groups:
(1) Control group: No paralysis. No surface acoustic waves' treatment.
(2) Control + SAW group: No paralysis. With surface acoustic waves' treatment.
(3) Azide group: With paralysis. No surface acoustic waves' treatment.
(4) Azide + SAW group: With paralysis. With surface acoustic waves' treatment.

We then compared the worms' movement ability and reproduction ability. The experiment was repeated. At least 400 worms were characterized in each of the four groups in both experiments.

The movement results for all groups in both experiments showed that more than 99.2% of the worms resumed activity after 30 minutes. For reproduction (Fig. S1), there was no significant difference in the number of offspring between any of the four groups after a one-way ANOVA test. From these results, we are confident that sodium azide paralysis and surface acoustic waves' treatment were safe for the worms.

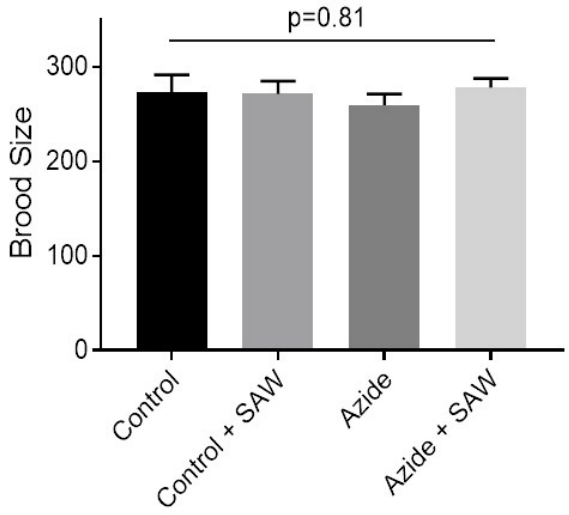

Figure S1. Reproduction results showed that there was no significant difference in reproduction ability between any of the 4 groups after a one-way ANOVA test.