

Description of Additional Supplementary Files

File name: Supplementary Movies

Description:

Supplementary Movies **1-14** show 500 simulated worms for 10 minutes on the quadrant choice assay, with upper right and lower left quadrants containing 100 mM NaCl, and the other two quadrants contain no NaCl. Corresponds to Figure 7.

Supplementary Movie 1: ASH ablated

Supplementary Movie 2: ASH ablated, no (de)sensitization in ASEL or ASER

Supplementary Movie 3: ASH ablated, no connection between ASEL and steering

Supplementary Movie 4: ASH ablated, no connection between ASEL and pirouettes

Supplementary Movie 5: ASH ablated, no connection between ASER and steering

Supplementary Movie 6: ASH ablated, no connection between ASER and pirouettes

Supplementary Movie 7: ASH ablated, ASEL ablated

Supplementary Movie 8: ASH ablated, ASER ablated

Supplementary Movie 9: ASH ablated, no steering

Supplementary Movie 10: ASH ablated, ASEL ablated, no steering

Supplementary Movie 11: ASH ablated, ASER ablated, no steering

Supplementary Movie 12: ASH ablated, no pirouettes

Supplementary Movie 13: ASH ablated, ASEL ablated, no pirouettes

Supplementary Movie 14: ASH ablated, ASER ablated, no pirouettes

Supplementary Movies **15-18** show 100 (out of 500) simulated worms on the spot assay, with a peak concentration of 100 mM NaCl and spot separation distance of 3.3 cm. Corresponds to Figure 9.

Supplementary Movie 15: wild type

Supplementary Movie 16: ASH ablated

Supplementary Movie 17: no (de)sensitization in ASEL or ASER

Supplementary Movie 18: ASH ablated, with no (de)sensitization in ASEL or ASER

Supplementary Movies **19-22** show 100 simulated worms on the spot assay, with a peak concentration of 200 mM and spot separation distance of 3.3 cm. Corresponds to Figure 9.

Supplementary Movie 19: wild type

Supplementary Movie 20: ASH ablated

Supplementary Movie 21: no (de)sensitization in ASEL or ASER

Supplementary Movie 22: ASH ablated, with no (de)sensitization in ASEL or ASER

Supplementary Movies **23-26** show 100 simulated worms on the spot assay, with a peak concentration of 100 mM and spot separation distance of 5.0 cm. Corresponds to Figure 9.

Supplementary Movie 23: wild type

Supplementary Movie 24: ASH ablated

Supplementary Movie 25: no (de)sensitization in ASEL or ASER

Supplementary Movie 26: ASH ablated, with no (de)sensitization in ASEL or ASER

Supplementary Movies **27-30** show 100 simulated worms on the spot assay, with a peak concentration of 200 mM and spot separation distance of 5.0 cm. Corresponds to Figure 9.

Supplementary Movie 27: wild type

Supplementary Movie 28: ASH ablated

Supplementary Movie 29: no (de)sensitization in ASEL or ASER

Supplementary Movie 30: ASH ablated, with no (de)sensitization in ASEL or ASER

File name: Supplementary Data 1

Description: Source data underlying figure 1

File name: Supplementary Data 2

Description: Source data underlying figure 2

File name: Supplementary Data 3

Description: Source data underlying figure 3

File name: Supplementary Data 4

Description: Source data underlying figure 4

File name: Supplementary Data 5

Description: Source data underlying figure 5

File name: Supplementary Data 6

Description: Source data underlying figure 6

File name: Supplementary Data 7

Description: Source data underlying figure 7

File name: Supplementary Data 8

Description: Source data underlying figure 8

File name: Supplementary Data 9

Description: Source data underlying figure 9