## Table 1: Recording sessions summary

| mouse | Date | Session Type | ADn HD | ADn total | RSC HD | RSC total | ADn → RSC | RSC → ADn | Pairs total | Electrodes and advancement – fraction of turns | | | | | | | | | | | New ADn HD ensemble | New RSC HD ensemble | New ADn rotation ensemble | New RSC rotation ensemble | New ADn dark ensemble | New RSC dark ensemble |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mouse 1 | carbon | fiber | | | N/A | N/A | N/A | N/A | N/A | | | | | | | | | | | | | | | | | | |
| | 4/11/19 | on/off | 14 | 19 | | | | | | | | | | | | | | | | | | | | | ✓ | |
| | 4/26/19 | on/off | 15 | 23 | | | | | | | | | | | | | | | | | | | | | | |
| | 4/30/19 | rotations+off | 11 | 18 | | | | | | | | | | | | | | | | | | | ✓ | | | |
| | 5/5/19 | rotations+off | 9 | 15 | | | | | | | | | | | | | | | | | | | | | | |
| | 5/29/19 | on/off | 8 | 31 | | | | | | | | | | | | | | | | | | | | | | |
| | 6/9/19 | on/off | 11 | 18 | | | | | | | | | | | | | | | | | | | | | | |
| | 6/18/19 | rotations+off | 15 | 20 | | | | | | | | | | | | | | | | | | | ✓ | | | |
| | 8/9/19 | rotations | 9 | 18 | | | | | | | | | | | | | | | | | | | | | | |
| | 8/12/19 | rotations | 16 | 21 | | | | | | | | | | | | | | | | | ✓ | | | | | |
| | 10/27/19 | rotations | 20 | 26 | | | | | | | | | | | | | | | | | | | ✓ | | | |
| | 10/28/19 | on/off | 3 | 27 | | | | | | | | | | | | | | | | | | | | | | |
| | 10/31/19 | rotations+off | 23 | 27 | | | | | | | | | | | | | | | | | | | | | | |
| mouse 2 | | | | | | | | | | RSC | RSC | RSC | RSC | RSC | N | ADn | ADn | ADn | | | | | | | | |
| | | | | | | | | | | 16 | 15 | 14 | 13 | 1,2 | 10,9 | 8,7 | 5, 6 | 3,4 | | | | | | | | |
| | 10/05/19 | rotations+off | 4 | 8 | 1 | 11 | 0 | 0 | 88 | | | | | 0.125 | 0.125 | | 0.125 | | | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | 10/08/19 | rotations+off | 1 | 8 | 1 | 9 | 0 | 0 | 72 | | | | | 0.125 | | | 0.125 | | | | | | ✓ | | | ✓ |
| | 10/09/19 | rotations | 1 | 6 | 0 | 7 | 0 | 0 | 42 | | | | | | | | | | | | ✓ | | | | | |
| | 10/09/19 | rotations | 0 | 5 | 0 | 7 | 0 | 0 | 35 | 0.125 | 0.125 | | | 0.125 | 0.125 | | 0.125 | | | | | | | | | |
| | 10/10/19 | rotations | 2 | 13 | 0 | 10 | 0 | 0 | 130 | | | | | 0.375 | 0.125 | 0.25 | 0.375 | 0.125 | | | | ✓ | ✓ | ✓ | | |
| | 10/14/19 | rotations+off | 6 | 13 | 0 | 11 | 0 | 0 | 143 | | | 0.25 | 0.25 | 0.125 | | | | | | | ✓ | | ✓ | | ✓ | |
| | 10/18/19 | rotations | 5 | 14 | 0 | 14 | 0 | 0 | 210 | | | 0.5 | 0.5 | | | | | -0.125 | | | | ✓ | | ✓ | | |
| | 10/21/19 | rotations+off | 4 | 14 | 0 | 12 | 0 | 0 | 140 | | | | | 0.4 | 0.4 | -0.1 | | | | | | | ✓ | | | |
| | 10/27/19 | rotations+off | 8 | 16 | 1 | 13 | 0 | 0 | 208 | | | | | | | | | | | | ✓ | | ✓ | ✓ | ✓ | |
| | 10/28/19 | on/off | 8 | 19 | 2 | 11 | 0 | 0 | 209 | 0.3 | 0.3 | | | | | | | | | | | | | | | |
| | 10/31/19 | rotations | 7 | 19 | 0 | 18 | 0 | 0 | 342 | | | | | | 0.25 | 0.125 | | -0.1 | | | | ✓ | | ✓ | | |
| | 12/03/19 | rotations+off | 12 | 19 | 0 | 14 | 0 | 0 | 266 | | | | | | 0.25 | 0.125 | | 0.125 | | | ✓ | | ✓ | | | ✓ |
| | 01/07/20 | rotations | 8 | 15 | 0 | 16 | 0 | 0 | 225 | | | | | | | | | | | | ✓ | | ✓ | | | |
| mouse 3 | | | N/A | N/A | | | N/A | N/A | N/A | | | | | | | | | | | | | | | | | |
| | 02/22/20 | rotations | | | 6 | 92 | | | | | | | | | | | | | | | | | | ✓ | | |
| | 02/23/20 | rotations | | | 14 | 94 | | | | | | | | | | | | | | | | | | | | |
| | 02/24/20 | rotations | | | 2 | 92 | | | | | | | | | | | | | | | | | | | | |
| | 02/29/20 | rotations | | | 4 | 104 | | | | | | | | | | | | | | | | | | ✓ | | |
| | 03/17/20 | rotations | | | 13 | 104 | | | | | | | | | | | | | | | | | | | | |
| | 03/19/20 | rotations | | | 7 | 101 | | | | | | | | | | | | | | | | | | | | |
| | 03/20/20 | rotations | | | 4 | 100 | | | | | | | | | | | | | | | | | | | | |
| | 03/21/20 | rotations | | | 6 | 104 | | | | | | | | | | | | | | | | | | | | |
| | 03/24/20 | rotations | | | 24 | 96 | | | | | | | | | | | | | | | | | | | | |
| | 03/25/20 | rotations | | | 17 | 104 | | | | | | | | | | | | | | | | ✓ | | | | |
| | 03/26/20 | rotations | | | 24 | 107 | | | | | | | | | | | | | | | | | | | | |
| | 03/27/20 | rotations | | | 16 | 105 | | | | | | | | | | | | | | | | | | | | |
| | 03/29/20 | rotations | | | 14 | 97 | | | | | | | | | | | | | | | | | | ✓ | | |
| | 03/31/20 | rotations | | | 15 | 98 | | | | | | | | | | | | | | | | | | | | |
| mouse 4 | | | | | | | | | | RSC | RSC | RSC | RSC | RSC | ADn | N | N | N | N | ADn | | | | | | |
| | | | | | | | | | | 9 | 10 | 11 | 12 | 13 | 14, 15 | 16,1 | 2,3 | 4,5 | 6,7 | 8 | | | | | | |
| | 02/28/20 | rotations | 2 | 6 | 1 | 33 | 0 | 0 | 198 | | | | | | | | 0.125 | | 0.125 | 0.125 | ✓ | ✓ | ✓ | ✓ | | |
| | 03/02/20 | rotations | 2 | 8 | 3 | 31 | 0 | 0 | 248 | | | | | | | | | | | 0.125 | | | | | | |
| | 03/07/20 | rotations | 1 | 7 | 6 | 42 | 0 | 0 | 287 | | | | | | 0.125 | 0.25 | 0.125 | 1 | 0.25 | 0.25 | | ✓ | | ✓ | | |
| | 03/12/20 | rotations | 1 | 4 | 9 | 39 | 0 | 0 | 156 | | | | | | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | | | ✓ | | | |
| | 03/13/20 | rotations | 4 | 6 | 6 | 35 | 0 | 0 | 210 | | | | | | 0.125 | 0.25 | | 0.25 | 0.25 | 0.25 | ✓ | | ✓ | | | |
| | 03/16/20 | rotations | 1 | 6 | 11 | 39 | 0 | 0 | 195 | | | | | | 0.1 | | | -0.1 | | -0.75 | | | | | | |
| | 03/19/20 | rotations | 1 | 4 | 3 | 31 | 0 | 0 | 124 | | | | | | -0.125 | -0.125 | | -0.125 | | 0.75 | | ✓ | ✓ | ✓ | | |
| | 03/20/20 | rotations | 1 | 7 | 4 | 34 | 0 | 0 | 238 | | | | | | -0.025 | -0.125 | | -0.025 | -0.25 | -0.025 | ✓ | | | | | |
| | 03/23/20 | rotations | 0 | 5 | 5 | 34 | 0 | 0 | 170 | | | | | | -0.25 | | | 0.125 | | 0.5 | | | ✓ | | | |
| | 03/25/20 | rotations | 2 | 12 | 9 | 31 | 0 | 0 | 372 | | | | | | 0.1 | | | | | | | | ✓ | | | |
| | 03/26/20 | rotations | 3 | 11 | 1 | 29 | 0 | 0 | 319 | | | | | | 0.725 | 0.125 | 0.125 | 1.25 | 0.125 | | ✓ | | | | | |
| | 03/31/20 | rotations | 3 | 11 | 2 | 33 | 0 | 0 | 363 | | | | | | | | | -0.75 | | | | | | | | |
| | 04/04/20 | rotations | 2 | 10 | 2 | 28 | 0 | 0 | 280 | | | | | | | | | -0.25 | | 0.125 | | | | | | |
| | 04/05/20 | rotations | 5 | 11 | 3 | 30 | 0 | 0 | 300 | | | | | | 0.25 | | | -0.5 | | | | | | | | |
| mouse 5 | | | | | | | | | | RSC | RSC | RSC | RSC | RSC | N | N | ADn | N | N | | | | | | | |
| | | | | | | | | | | 15, 16 | 14 | 13, 12 | 2 | 1 | 11 | 10,9 | 5, 6 | 4 | 3 | | | | | | | |
| | 03/23/20 | rotations | 2 | 3 | 5 | 26 | 10 | 0 | 78 | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | | |
| | 03/24/20 | rotations | 3 | 4 | 4 | 25 | 14 | 0 | 100 | | | | | | | | 0.125 | | | | | | | | | |
| | 03/28/20 | rotations | 3 | 3 | 3 | 27 | 10 | 0 | 81 | | 0.125 | 2 | | | 0.125 | 0.125 | 0.125 | | 1 | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 03/31/20 | rotations | 3 | 3 | 3 | 27 | 11 | 0 | 81 | | | | | | | | | | | ✓ | | ✓ | | | |
| | 04/20/20 | rotations | 2 | 5 | 4 | 31 | 17 | 0 | 140 | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | | |
| | 04/21/21 | rotations | 1 | 5 | 2 | 24 | 12 | 0 | 115 | | 0.25 | 0.25 | | | 0.4 | 0.4 | 0.25 | | 0.25 | | | | ✓ | | |
| | 04/24/20 | rotations | 1 | 3 | 2 | 30 | 9 | 0 | 87 | | 0.375 | 0.375 | | | 0.375 | 0.375 | 0.125 | | 0.375 | | ✓ | ✓ | ✓ | ✓ | | |
| | 04/28/20 | rotations | 3 | 3 | 3 | 23 | 10 | 0 | 69 | | 0.125 | 0.125 | | | 0.125 | 0.125 | 0.125 | | 0.125 | | | | ✓ | | |
| | 05/01/20 | rotations | 2 | 3 | 0 | 22 | 12 | 0 | 66 | | | | | | | | | | | | | | | | |
| mouse 6 | | | | | | | | | | RSC | RSC | RSC | | | ADn | N | | | | | | | | | |
| | | | | | | | | | | 7 | 2 | 1 | | | 9,8 | 11, 10 | | | | | | | | | |
| | 03/23/20 | rotations | 4 | 4 | 0 | 1 | 0 | 0 | 4 | | | | | | | | | | | ✓ | | ✓ | | | |
| | 03/24/20 | rotations | 4 | 4 | 1 | 4 | 0 | 0 | 16 | | | | | | | | | | | | ✓ | | | | |
| | 03/26/20 | rotations | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0.25 | 0.24 | 0.25 | | | | 0.25 | | | | | | | | | |
| | 03/27/20 | rotations | 2 | 3 | 0 | 0 | 0 | 0 | 0 | | | | | | 0.125 | | | | | | | | | | |
| | 03/31/20 | rotations | 4 | 5 | 0 | 0 | 0 | 0 | 0 | | | | | | | 0.25 | | | | ✓ | | ✓ | | | |
| | 04/10/20 | rotations | 4 | 6 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | |
| | 04/11/20 | rotations | 3 | 5 | 0 | 0 | 0 | 0 | 0 | | | | | | | 0.25 | | | | | | | | | |
| | 04/15/20 | rotations | 5 | 9 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | ✓ | | | | | |
| | 04/17/20 | rotations+off | 5 | 7 | 0 | 2 | 0 | 0 | 14 | | | | | | | | | | | | | ✓ | | ✓ | |
| | 04/18/20 | rotations | 4 | 8 | 0 | 2 | 0 | 0 | 14 | | | | | | | | | | | | | | | | |
| | 04/19/20 | rotations+off | 5 | 7 | 0 | 1 | 0 | 0 | 7 | | | 0.25 | | | 0.125 | -0.25 | | | | | | | | | |
| | 04/20/20 | rotations | 4 | 5 | 0 | 2 | 0 | 0 | 10 | | | | | | | | | | | ✓ | | ✓ | | | |
| | 04/20/20 | rotations+off | 3 | 4 | 0 | 2 | 0 | 0 | 8 | | | | | | | | | | | | | | | | |
| | 04/21/20 | rotations | 5 | 7 | 0 | 3 | 0 | 0 | 21 | | | | | | | | | | | | | | | | |
| mouse 7 | | | | | | | | | | RSC | RSC | RSC | RSC | N | ADn | ADn | N | | | | | | | | |
| | | | | | | | | | | 6,7 | 9,8 | 10, 11 | 12, 13 | 14, 15 | 16,1 | 2,3 | 4,5 | | | | | | | | |
| | 07/02/20 | rotations | 4 | 8 | 1 | 38 | 14 | 0 | 296 | 0.25 | | | | | 0.375 | | 0.375 | | | ✓ | ✓ | ✓ | ✓ | | |
| | 07/07/20 | rotations | 5 | 5 | 6 | 34 | 20 | 1 | 170 | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | | |
| | 07/09/20 | rotations | 4 | 5 | 0 | 29 | 16 | 0 | 145 | | | | | | | | | | | | | | | | |
| mouse 8 | | | | | | | | | | RSC | RSC | RSC | RSC | N | ADn | N | N | | | | | | | | |
| | | | | | | | | | | 12, 13 | 14, 15 | 16,1 | 2,3 | 4,5 | 6,7 | 8,9 | 10, 11 | | | | | | | | |
| | 07/22/20 | rotations | 4 | 9 | 1 | 19 | 37 | 0 | 171 | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | | |
| | 07/24/20 | rotations | 3 | 10 | 0 | 13 | 21 | 0 | 130 | | | | | | | | | | | | | | | | |
| mouse 9 | | | | | | | | | | RSC | RSC | RSC | RSC | RSC | N | N | ADn | N | ADn | | | | | | |
| | | | | | | | | | | 6 | 7,8 | 9 | 10,11 | 12,13 | 14 | 15 | 16,1 | 2,3 | 4,5 | | | | | | |
| | 01/26/21 | on/off | 3 | 4 | 3 | 20 | 19 | 0 | 80 | -0.25 | | | | | 0.5 | | -0.75 | | 0.125 | ✓ | ✓ | | | ✓ | ✓ |
| | 02/04/21 | on/off | 1 | 3 | 4 | 12 | 6 | 0 | 36 | 0.125 | | | | | 0.125 | | 0.125 | | | ✓ | | | | ✓ | ✓ |
| | 02/06/21 | on/off | 2 | 4 | 2 | 17 | 11 | 0 | 68 | 0.25 | | | | | | | -1 | -0.25 | | | | | | | |
| | 02/11/21 | on/off | 2 | 3 | 3 | 21 | 11 | 0 | 63 | | | | | | | | | | | | | | | ✓ | |
| | 02/12/21 | rotations | 2 | 4 | 2 | 19 | 22 | 0 | 76 | | | | | | | | | | | | | ✓ | ✓ | | |
| | 02/12/21 | rotations | 2 | 4 | 5 | 20 | 32 | 0 | 80 | | | | | | 0.25 | | 0.125 | | | | | | | | |
| | 02/19/21 | on/off | 2 | 4 | 1 | 19 | 13 | 2 | 76 | 0.25 | 0.25 | | 0.125 | | 0.125 | | 0.25 | 0.25 | | | ✓ | | | | |
| | 03/07/21 | rotations | 2 | 4 | 0 | 14 | 15 | 0 | 56 | | 0.25 | 1 | 0.125 | 0.125 | | | 0.125 | 0.125 | 0.125 | | ✓ | | ✓ | | |
| | 03/12/21 | on/off | 4 | 5 | 5 | 13 | 24 | 0 | 65 | | | | | | | | | | | ✓ | ✓ | | | ✓ | ✓ |
| | 03/15/21 | rotations | 3 | 5 | 3 | 15 | 23 | 0 | 75 | | | | | | | | | | | | | ✓ | ✓ | | |
| | 03/17/21 | rotations | 2 | 4 | 4 | 15 | 20 | 0 | 60 | -1 | -1 | 1 | 0.25 | 0.125 | | | 0.125 | 0.125 | 0.25 | | | | | | |
| | 03/20/21 | rotations | 3 | 9 | 4 | 17 | 19 | 1 | 153 | 2 | 1.5 | 0.5 | 0.125 | 0.125 | | | | -0.5 | 0.25 | ✓ | | ✓ | ✓ | | |
| | 03/23/21 | on/off | 4 | 10 | 5 | 13 | 14 | 0 | 130 | | | | | | | | | | | | | | | ✓ | ✓ |
| | 06/24/21 | on/off | 3 | 4 | 5 | 20 | 25 | 0 | 80 | | | | | | | | | | | | ✓ | | | ✓ | ✓ |
| | 06/25/21 | on/off | 2 | 4 | 2 | 16 | 19 | 0 | 64 | | | | | | | | | | | | | | | | |
| | 06/26/21 | on/off | 2 | 3 | 2 | 15 | 14 | 0 | 45 | 0.25 | | 0.25 | | | | | | | | | | | | | ✓ |
| | 06/27/21 | on/off | 2 | 3 | 2 | 14 | 13 | 0 | 42 | | | | | | | | | | | | | | | | |
| mouse 10 | | | | | | | | | | RSC | RSC | RSC | RSC | RSC | N | N | N | N | N | | | | | | |
| | | | N/A | N/A | | | N/A | N/A | N/A | 9 | 8 | 7 | 6,5 | 4 | 2,3 | 1,16 | 14, 15 | 12, 13 | 11, 10 | | | | | | |
| | 03/18/20 | rotations | | | 0 | 18 | | | | | | | | | | | 0.25 | 0.25 | 0.25 | | ✓ | | ✓ | | |
| | 03/20/23 | rotations | | | 4 | 22 | | | | | | | | | | | | | | | | | | | |
| | 03/23/20 | rotations | | | 2 | 18 | | | | | | | | | | | | | | | | | | | |
| | 03/24/20 | rotations | | | 1 | 13 | | | | | | | | | | | | | | | | | ✓ | | |
| | 03/26/20 | rotations | | | 0 | 24 | | | | | | | | | 0.125 | 0.125 | 0.125 | 0.125 | 0.125 | | ✓ | | ✓ | | |
| | 04/20/20 | rotations | | | 1 | 17 | | | | | | | | | | | | | | | | | ✓ | | |
| mouse 11 | | | | | | | | | | RSC | RSC | RSC | RSC | RSC | N | N | N | ADn | ADn | | | | | | |
| | | | | | | | | | | 11 | 10,9 | 8 | 6,7 | 5 | 2,3 | 1,16 | 15, 14 | 13 | 12 | | | | | | |
| | 03/02/20 | rotations | 2 | 6 | 7 | 30 | 18 | 0 | 180 | 0.25 | 0.25 | | -0.125 | | -0.25 | -0.125 | 1.825 | 1 | | ✓ | ✓ | ✓ | ✓ | | |
| | 03/27/20 | rotations | 0 | 5 | 2 | 33 | 13 | 0 | 160 | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | | |
| mouse 12 | | | | | | | | | | RSC | RSC | RSC | RSC | RSC | ADn /AV | ADn | N | N | | | | | | | |
| | | | | | | | | | | 6,7 | 8 | 9,10 | 12, 11 | 13 | 16, 15 | 1,2 | 3,4 | 5 | | | | | | | |
| | 01/15/21 | rotations | 3 | 5 | 1 | 8 | 13 | 0 | 40 | 0.375 | | 0.25 | 0.375 | 0.5 | 0.5 | 0.625 | 0.625 | 0.125 | | ✓ | ✓ | ✓ | ✓ | | |
| | 01/19/21 | rotations | 5 | 8 | 1 | 6 | 14 | 0 | 42 | 0.2 | | 0.2 | 0.2 | | | | 0.125 | 0.125 | | ✓ | | ✓ | ✓ | | |
| | 01/21/21 | on/off | 3 | 6 | 3 | 6 | 16 | 0 | 36 | -1.975 | | 0.875 | 0.625 | | 0.325 | 0.5 | 1.375 | 0.625 | | | | | | ✓ | ✓ |
| | 02/04/21 | on/off | 4 | 7 | 1 | 8 | 14 | 0 | 56 | 3 | | | | | 0.125 | 0.125 | 0.125 | | | ✓ | | | | ✓ | ✓ |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 02/10/21 | on/off | 4 | 8 | 1 | 7 | 10 | 0 | 56 | 1.5 | 0.5 | | | | 0.625 | -0.5 | -0.325 | 0.25 | | | | | | | |
| | 03/05/21 | rotations | 6 | 13 | 0 | 6 | 10 | 0 | 78 | | | | | | | 0.125 | 0.125 | | | | ✓ | ✓ | ✓ | ✓ | | |
| | 03/11/21 | on/off | 7 | 11 | 0 | 5 | 3 | 0 | 55 | | | | | | | | | | | | | | | | ✓ | |
| | 03/11/21 | on/off | 3 | 9 | 1 | 5 | 2 | 0 | 45 | | 0.125 | | | | 0.125 | 0.25 | 0.125 | | | | | | | | | ✓ |
| | 03/13/21 | on/off | 6 | 10 | 0 | 7 | 9 | 0 | 70 | | | | | | | 0.25 | 0.125 | 0.25 | | | ✓ | | | | ✓ | |
| | 03/17/21 | rotations | 6 | 10 | 1 | 7 | 13 | 0 | 70 | | 0.25 | | | 0.125 | 0.25 | 0.25 | 0.5 | | | | | | ✓ | | | |
| | 03/20/21 | rotations | 4 | 10 | 0 | 7 | 15 | 0 | 70 | | | | | | | | | | | | | ✓ | | ✓ | | |
| | 03/22/21 | on/off | 5 | 10 | 0 | 7 | 9 | 0 | 70 | | | | | 0.125 | 0.125 | 0.5 | 0.5 | 0.125 | | | | | | | | |
| | 06/25/21 | on/off | 7 | 13 | 1 | 6 | 3 | 0 | 78 | | | | | | | | | | | | ✓ | | | | ✓ | |
| | 06/26/21 | on/off | 6 | 13 | 2 | 7 | 3 | 0 | 91 | | | | | | | | | | | | | | | | | |
| | 06/27/21 | on/off | 6 | 12 | 1 | 5 | 3 | 0 | 60 | | | | | | | | | | | | | | | | | ✓ |