

# Behaviour tracking platforms



A

## Metadata

| id         | machine_name         | date              | ... | condition              | sex              | ... | p              |
|------------|----------------------|-------------------|-----|------------------------|------------------|-----|----------------|
| xxx...xx x | machine_001          | 2016-09-01        | ... | A                      | M                | ... | p <sub>1</sub> |
| xxx...xx y | machine_001          | 2016-09-01        | ... | B                      | M                | ... | p <sub>2</sub> |
| xxx...xx z | machine_002          | 2016-09-03        | ... | A                      | F                | ... | p <sub>3</sub> |
| ⋮          | ⋮                    | ⋮                 | ⋮   | ⋮                      | ⋮                | ⋮   | ⋮              |
| n          | machine <sub>n</sub> | date <sub>n</sub> | ... | condition <sub>n</sub> | sex <sub>n</sub> | ... | p <sub>n</sub> |

Platform fields      Experiment fields

## Data


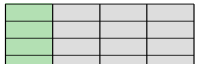
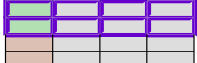
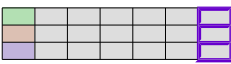
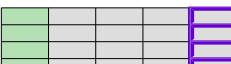
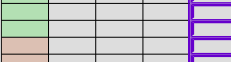
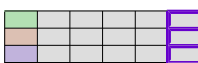
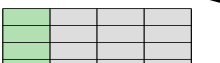
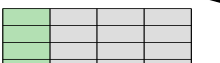
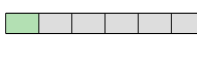
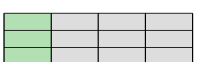

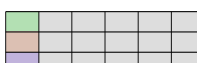
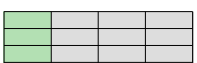
| id         | t | activity | ... | q                            |
|------------|---|----------|-----|------------------------------|
| xxx...xx x | 1 | 1        | ⋮   | q <sub>1,1</sub>             |
| xxx...xx x | 2 | 0        | ⋮   | q <sub>1,2</sub>             |
| xxx...xx x | 3 | 0        | ⋮   | q <sub>1,3</sub>             |
| xxx...xx x | ⋮ | ⋮        | ⋮   | ⋮                            |
| xxx...xx y | ⋮ | ⋮        | ⋮   | ⋮                            |
| xxx...xx z | 1 | 0        | ⋮   | q <sub>3,1</sub>             |
| xxx...xx z | 2 | 2        | ⋮   | q <sub>3,2</sub>             |
| xxx...xx z | 3 | 0        | ⋮   | q <sub>3,3</sub>             |
| xxx...xx z | ⋮ | ⋮        | ⋮   | ⋮                            |
| ⋮          | ⋮ | ⋮        | ⋮   | ⋮                            |
| n          | ⋮ | ⋮        | ⋮   | q <sub>n,k<sub>n</sub></sub> |

+

B

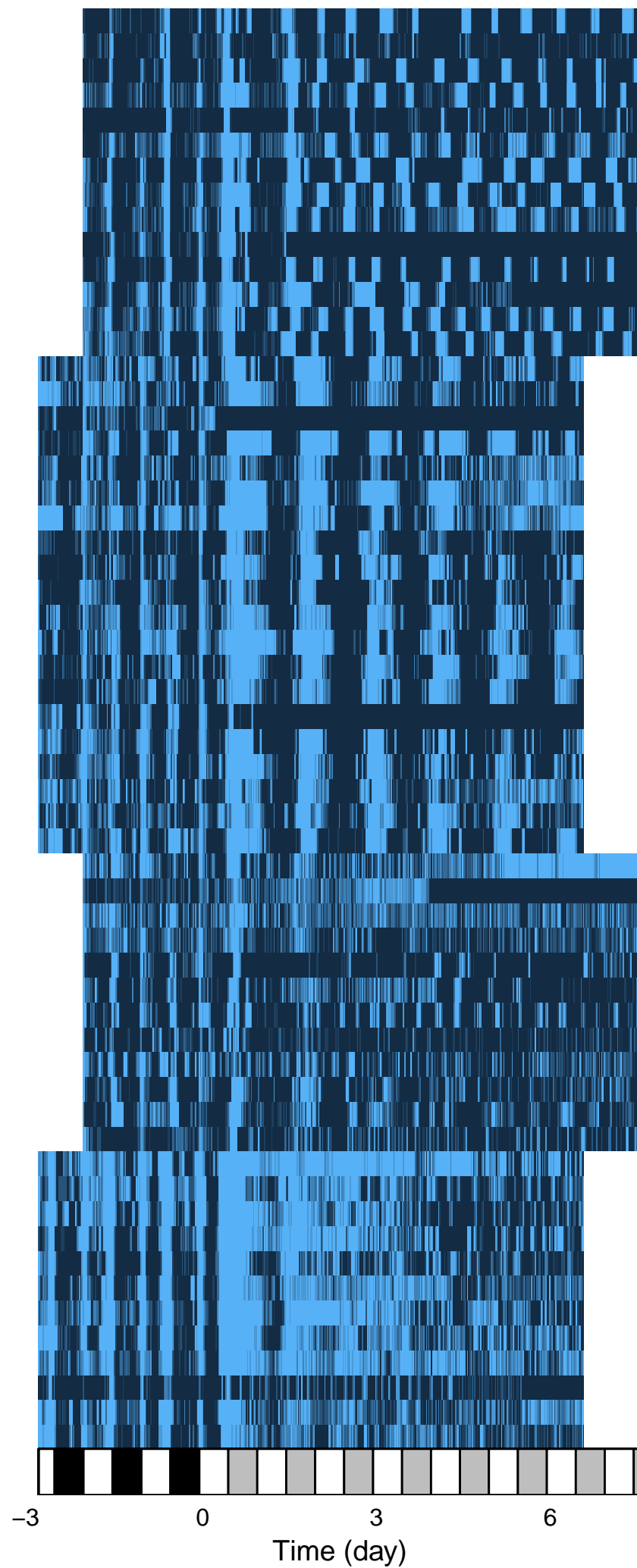
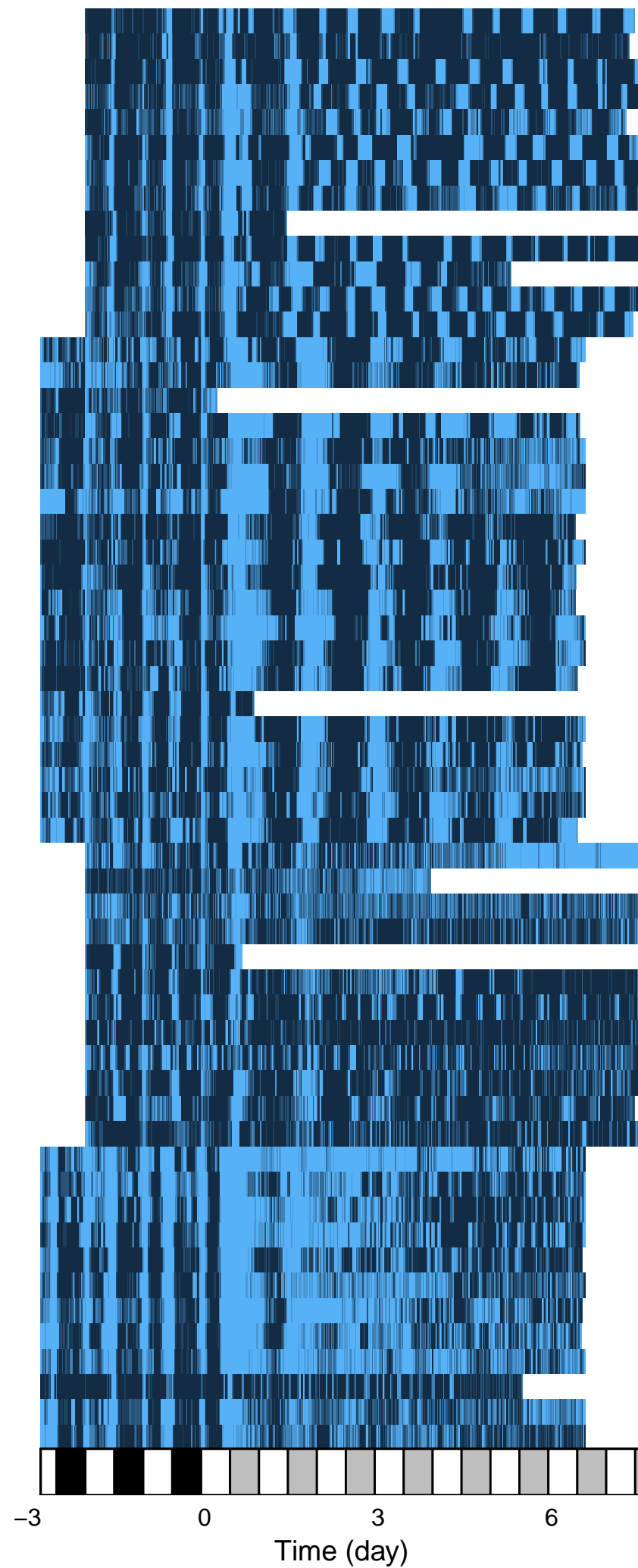
## Metadata

## Data

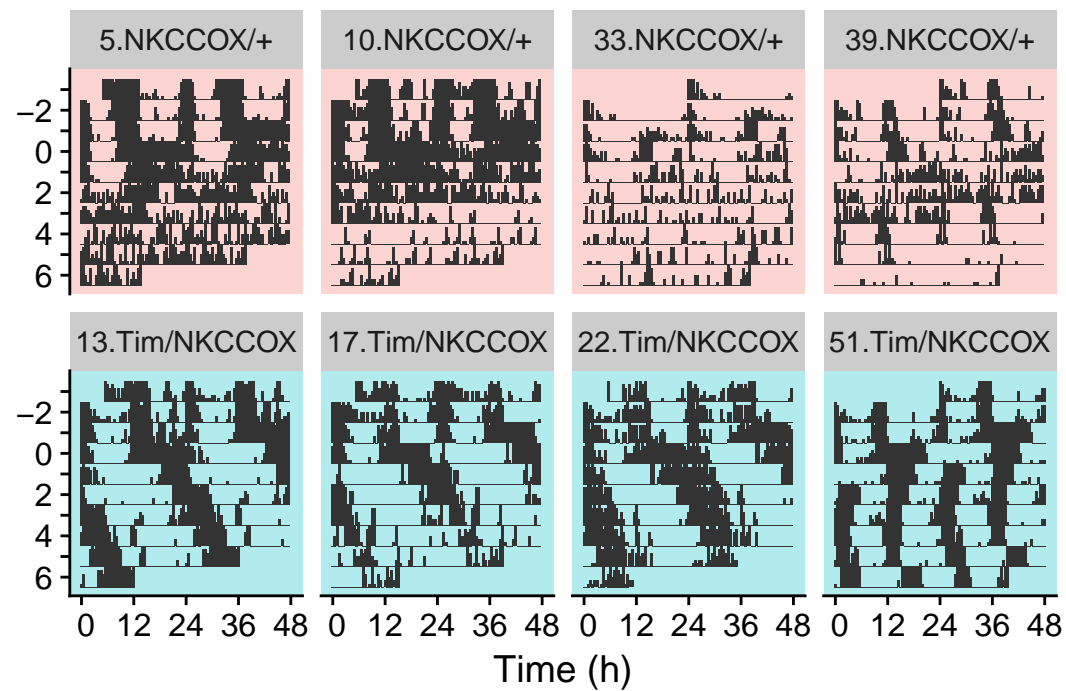
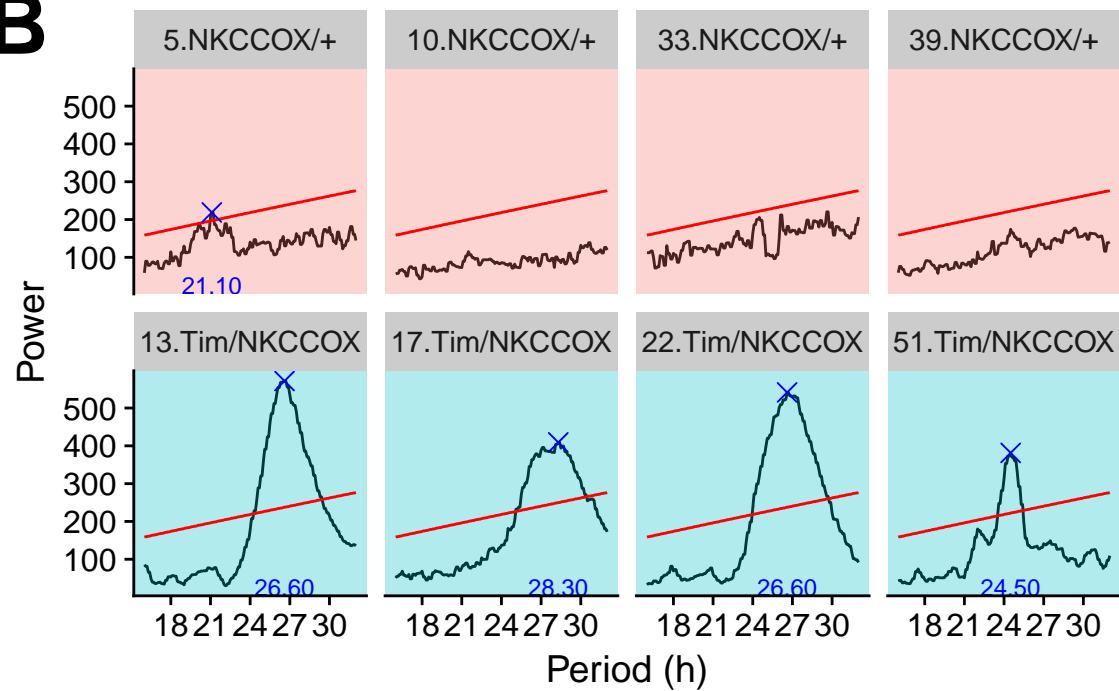
|  |  |  |
|--|--|--|
| Select                                 | <b>dt[CRITERIA, meta = TRUE]</b>  <pre>&gt; male_meta &lt;- dt[sex == "M",   meta = TRUE]</pre>   | <b>dt[CRITERIA]</b>  <pre>&gt; late_dt &lt;- dt[t &gt; 5]</pre> <p>Note: metadata is updated when selection removes all data from one id.</p>              |
| Alter, create & delete (meta)variables | <b>dt[, X := value, meta = TRUE]</b>  <pre>&gt; dt[, genotype := "wt", meta = TRUE] &gt; dt[, sex := NULL, meta = TRUE] # delete</pre>  | <b>dt[, Y := value]</b>  <pre>&gt; dt[, t_2 := t-1] &gt; dt[, t := NULL] # delete t</pre> <p>Note: update data in place. No copy of dt in memory.</p>  |
| Expand metavariables as variables      | <b>dt[xmv(X)]</b>  <pre>&gt; dt &lt;- dt[xmv(sex) == "M"] # select data with sex &gt; dt[, s := xmv(sex)] # copy metavariable as variable</pre>    |   |
| Aggregate & summary                    | <b>dt[, OPERATION, by = id]</b>  <pre>&gt; # mean activity, per individual &gt; dt &lt;- dt[,.(   mean_act = mean(activity,     ), by = id] &gt; dt[, .N, by = id] # count reads per id</pre>  | <b>OPERATION</b>    |
| Join data & metadata                   | <b>rejoin(dt)</b>  <pre>&gt; full_table &lt;- rejoin(dt)</pre> <p>Note: used mostly after aggregation or preprocessing</p>  | <b>REJOIN</b>   |

**A**

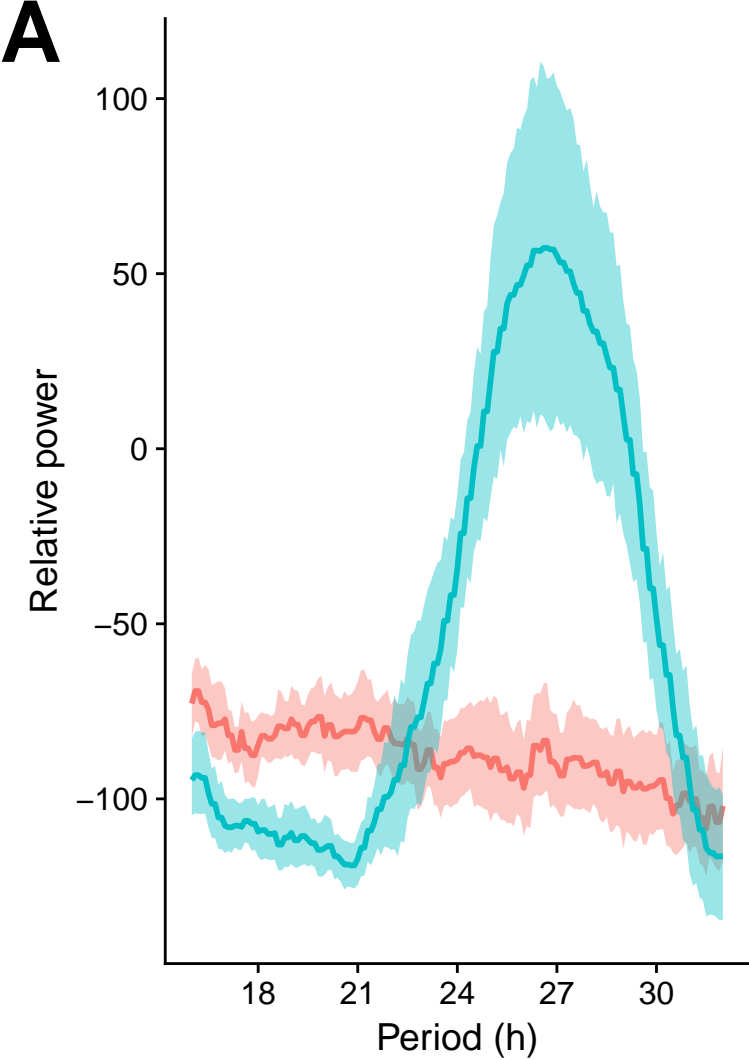
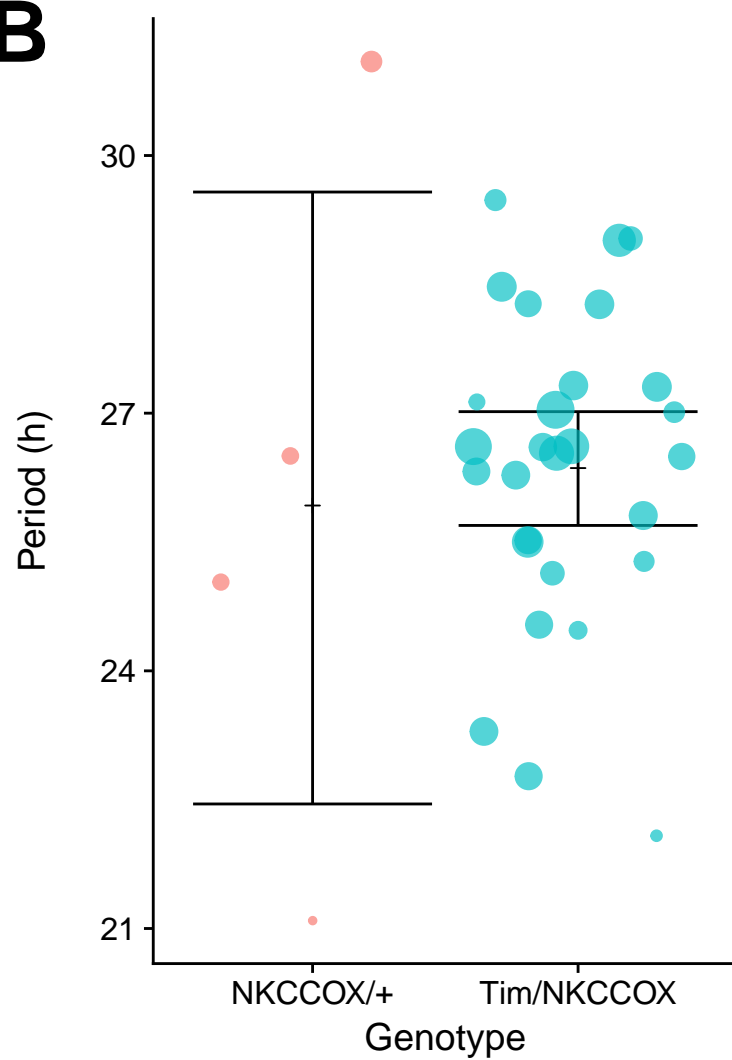
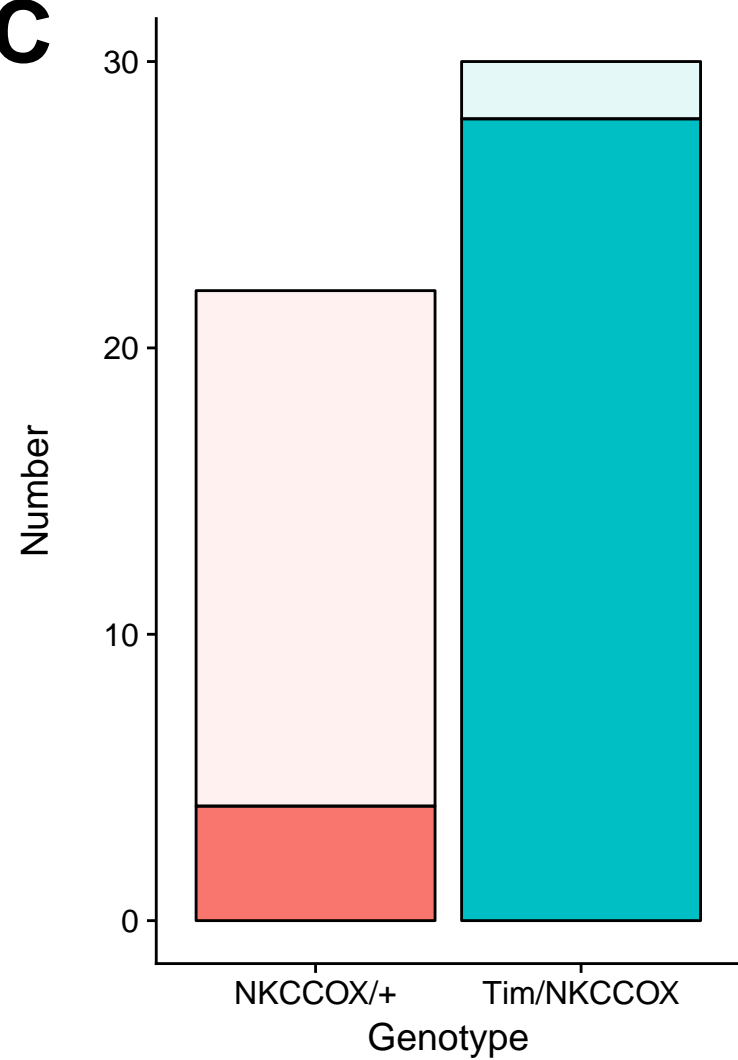
58.Tim/NKCCOX  
57.Tim/NKCCOX  
56.Tim/NKCCOX  
55.Tim/NKCCOX  
54.Tim/NKCCOX  
53.Tim/NKCCOX  
52.Tim/NKCCOX  
51.Tim/NKCCOX  
50.Tim/NKCCOX  
49.Tim/NKCCOX  
48.Tim/NKCCOX  
47.Tim/NKCCOX  
46.Tim/NKCCOX  
45.Tim/NKCCOX  
32.Tim/NKCCOX  
31.Tim/NKCCOX  
30.Tim/NKCCOX  
29.Tim/NKCCOX  
28.Tim/NKCCOX  
27.Tim/NKCCOX  
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25.Tim/NKCCOX  
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20.Tim/NKCCOX  
19.Tim/NKCCOX  
18.Tim/NKCCOX  
17.Tim/NKCCOX  
16.Tim/NKCCOX  
15.Tim/NKCCOX  
14.Tim/NKCCOX  
13.Tim/NKCCOX  
44.NKCCOX/+  
43.NKCCOX/+  
42.NKCCOX/+  
41.NKCCOX/+  
40.NKCCOX/+  
39.NKCCOX/+  
38.NKCCOX/+  
37.NKCCOX/+  
36.NKCCOX/+  
35.NKCCOX/+  
34.NKCCOX/+  
33.NKCCOX/+  
12.NKCCOX/+  
11.NKCCOX/+  
10.NKCCOX/+  
9.NKCCOX/+  
8.NKCCOX/+  
7.NKCCOX/+  
6.NKCCOX/+  
5.NKCCOX/+  
4.NKCCOX/+  
3.NKCCOX/+  
2.NKCCOX/+  
1.NKCCOX/+

**B**

Moving 0% 50% 100%

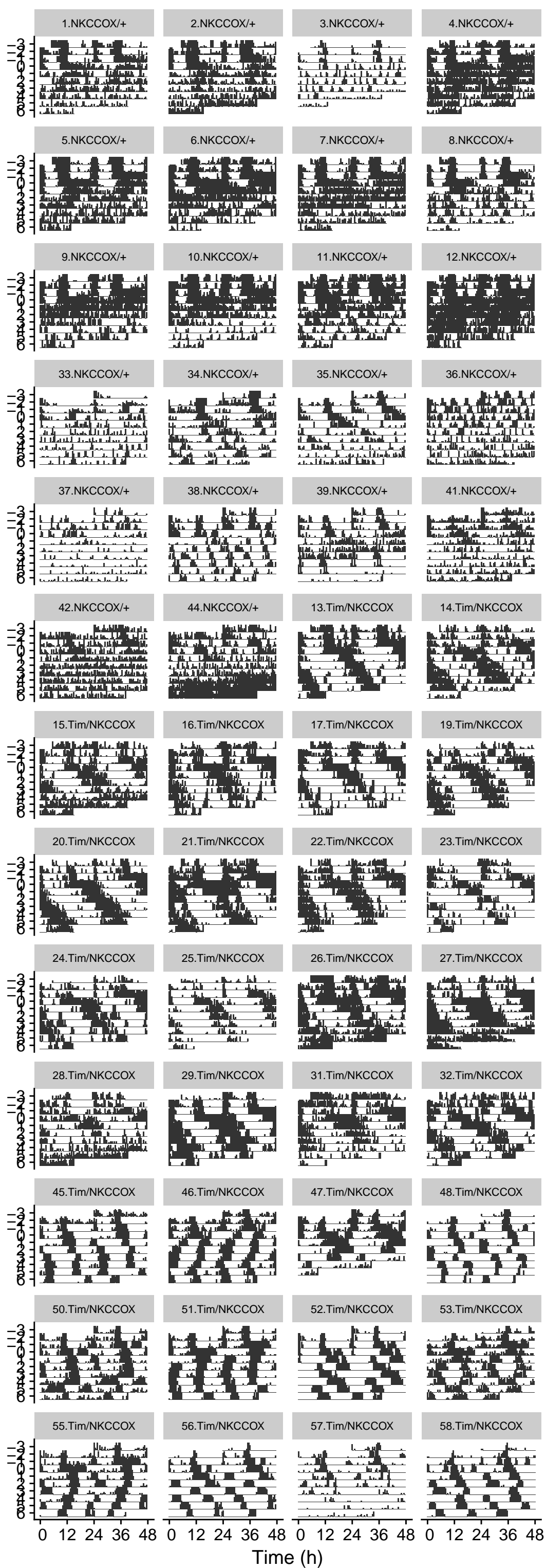
**A****B**

Genotype ■ NKCCOX/+ ■ Tim/NKCCOX

**A****B****C**

Genotype ■ NKCCOX/+ ■ Tim/NKCCOX    Peak power ● 300 ● 400 ● 500    ■ Arhythmic ■ Rhythmic

A



B

