

Behaviour tracking platforms



A

Metadata

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

Platform fields

Experiment fields

+

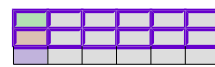
Data

id	t	activity	...	q
xxx...xx x	1	1	⋮	q _{1,1}
xxx...xx x	2	0	⋮	q _{1,2}
xxx...xx x	3	0	⋮	q _{1,3}
xxx...xx x	⋮	⋮	⋮	⋮
xxx...xx y	⋮	⋮	⋮	⋮
xxx...xx z	1	0	⋮	q _{3,1}
xxx...xx z	2	2	⋮	q _{3,2}
xxx...xx z	3	0	⋮	q _{3,3}
xxx...xx z	⋮	⋮	⋮	⋮
⋮	⋮	⋮	⋮	⋮
n	⋮	⋮	⋮	q _{n,k_n}

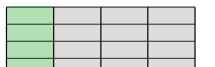
B

Metadata

Select

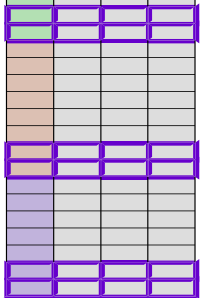
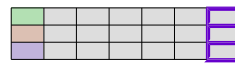
dt[CRITERIA, meta = TRUE]

```
> male_meta <- dt[sex == "M",
  meta = TRUE]
```

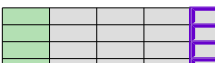
dt[CRITERIA]

```
> late_dt <- dt[t > 5]
```

Note: metadata is updated when selection removes all data from one id.

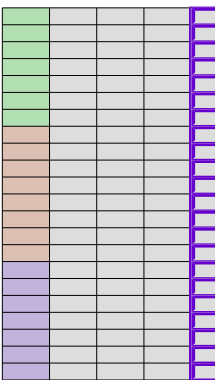
Alter, create & delete
(meta)variables**dt[, X := value, meta = TRUE]**

```
> dt[, genotype := "wt", meta = TRUE]
> dt[, sex := NULL, meta = TRUE] # delete
```

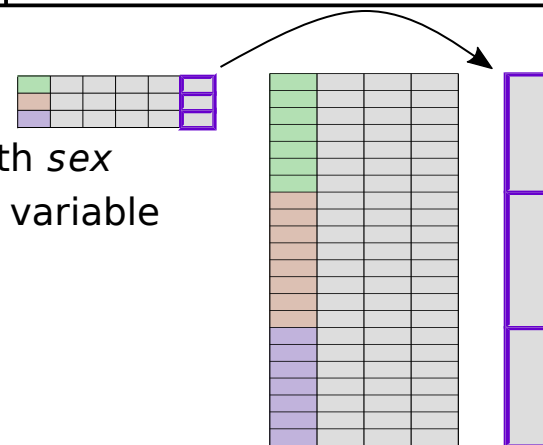
dt[, Y := value]

```
> dt[, t_2 := t-1]
> dt[, t := NULL] # delete t
```

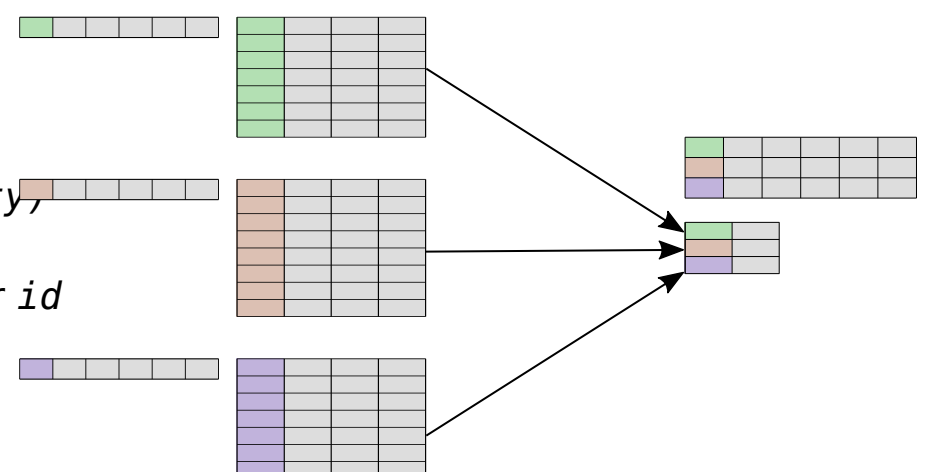
Note: update data in place.
No copy of dt in memory.

Expand
metavariables
as variables**dt[xmv(X)]**

```
> dt <- dt[xmv(sex) == "M"] # select data with sex
> dt[, s := xmv(sex)] # copy metavariable as variable
```

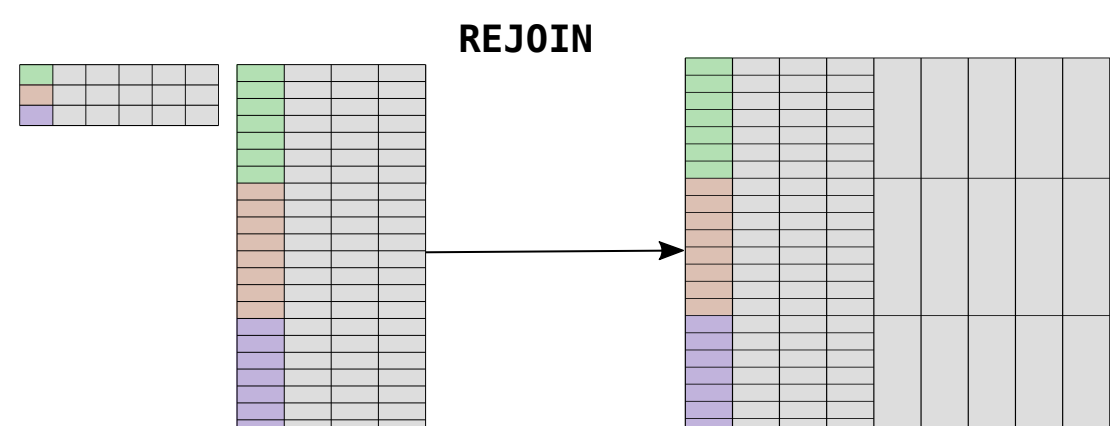
Aggregate &
summary**dt[, OPERATION, by = id]**

```
> # mean activity, per individual
> dt <- dt[,.(
  mean_act = mean(activity,
    ), by = id]
> dt[, .N, by = id] # count reads per id
```

Join data &
metadata**rejoin(dt)**

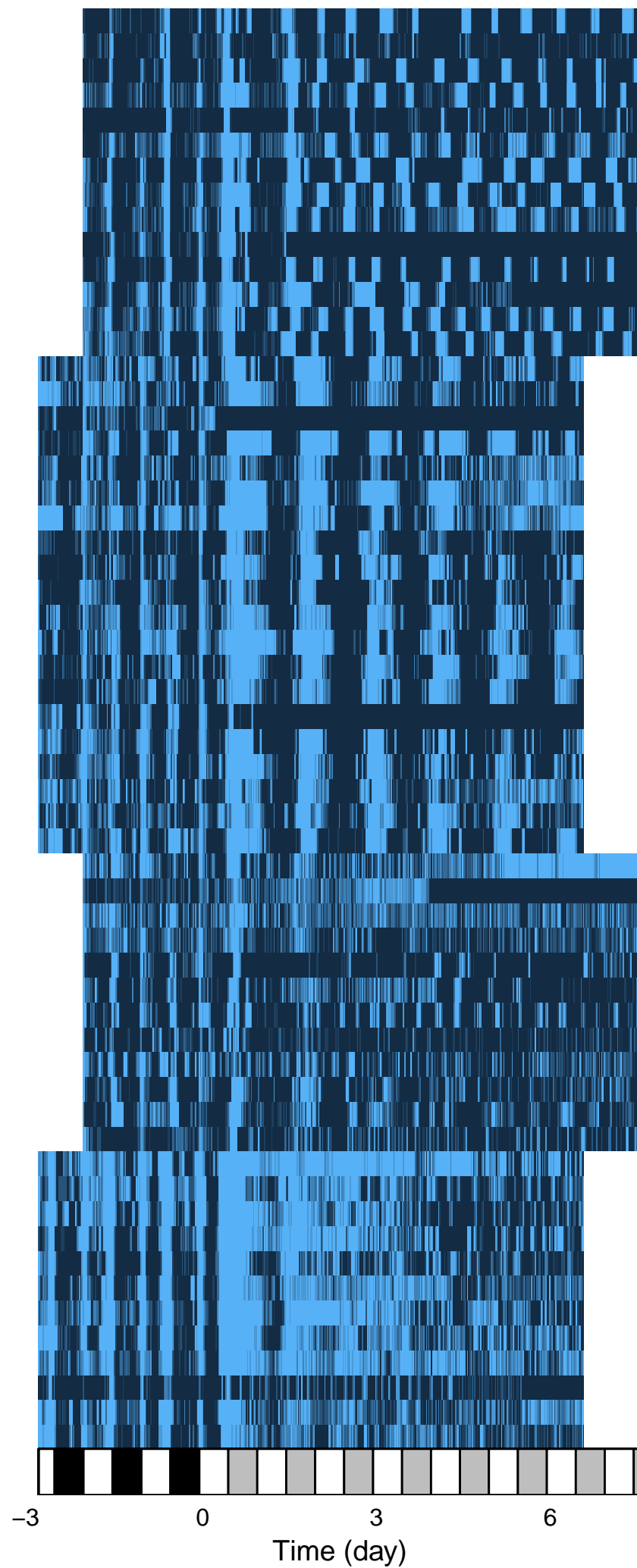
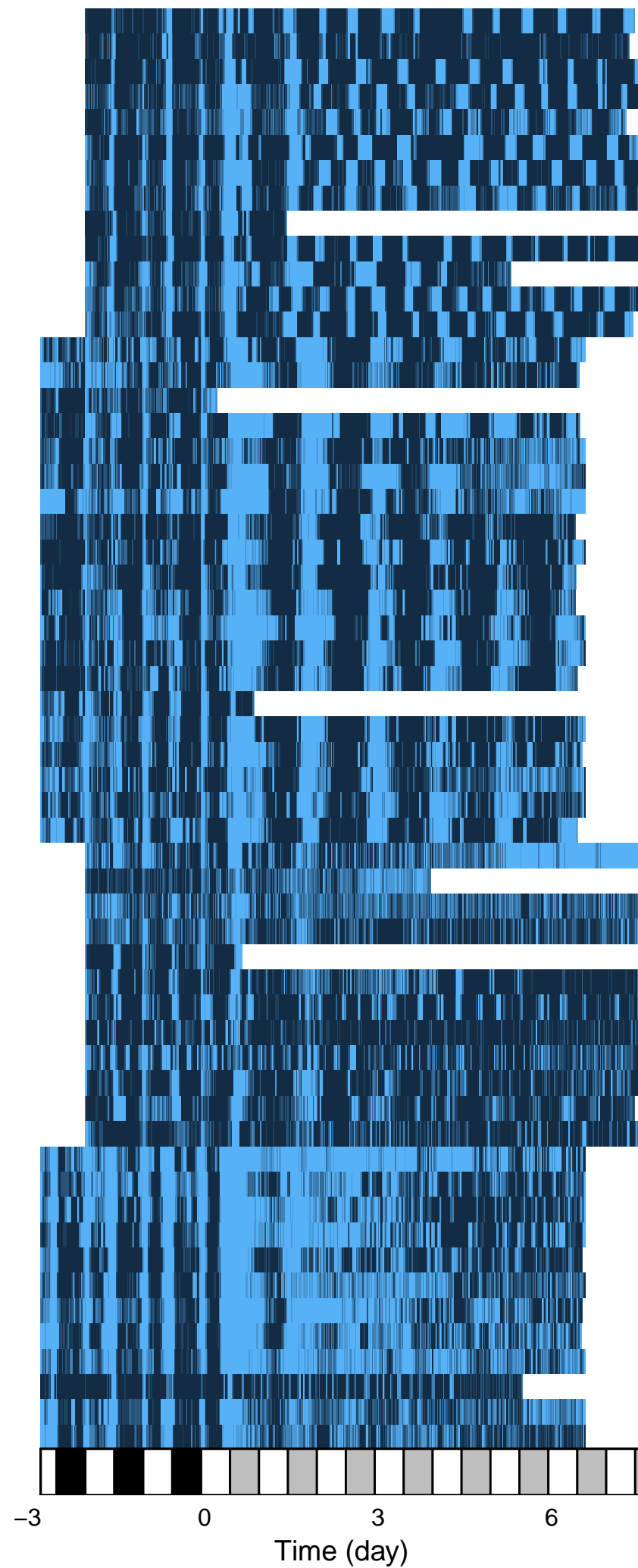
```
> full_table <- rejoin(dt)
```

Note: used mostly after aggregation
or preprocessing

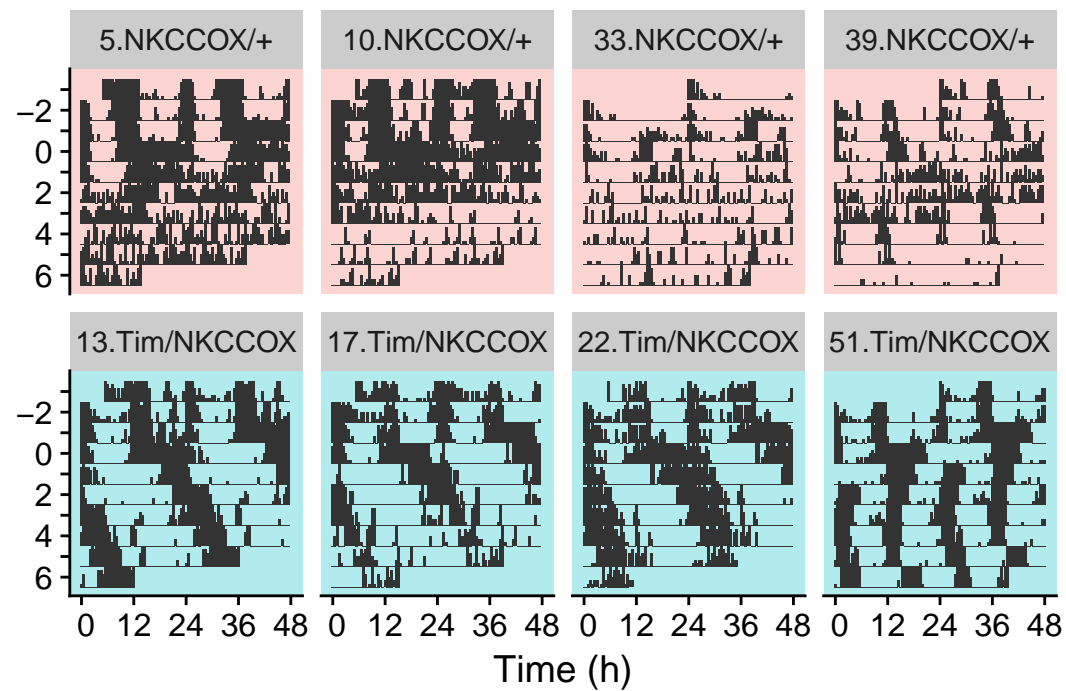
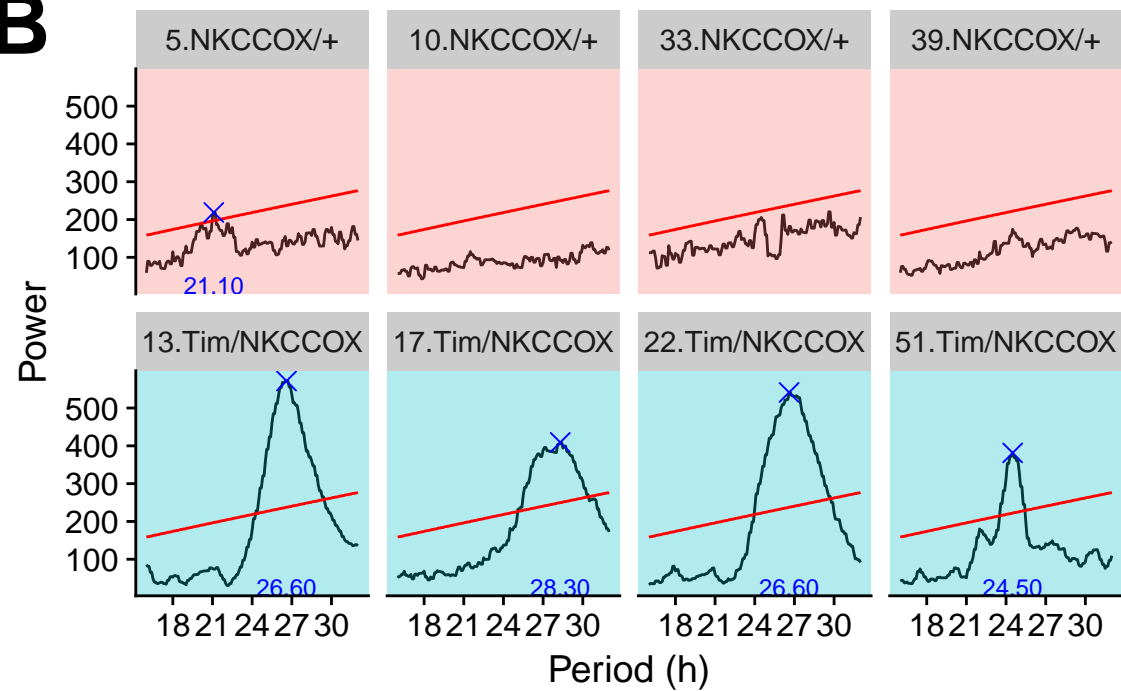


A

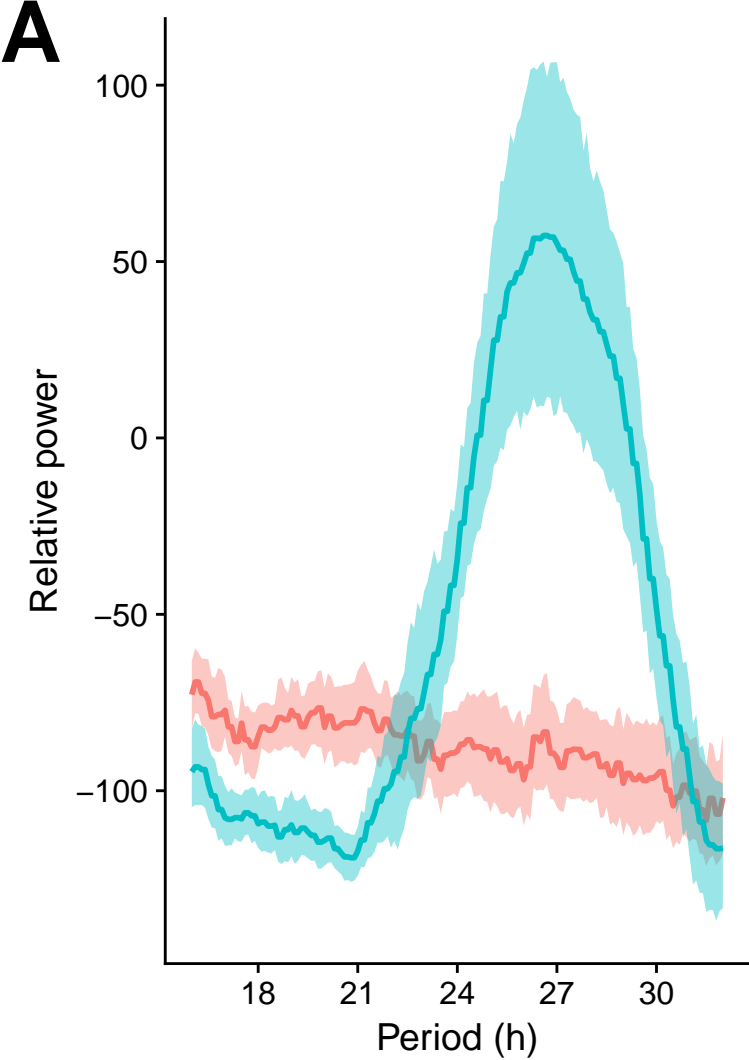
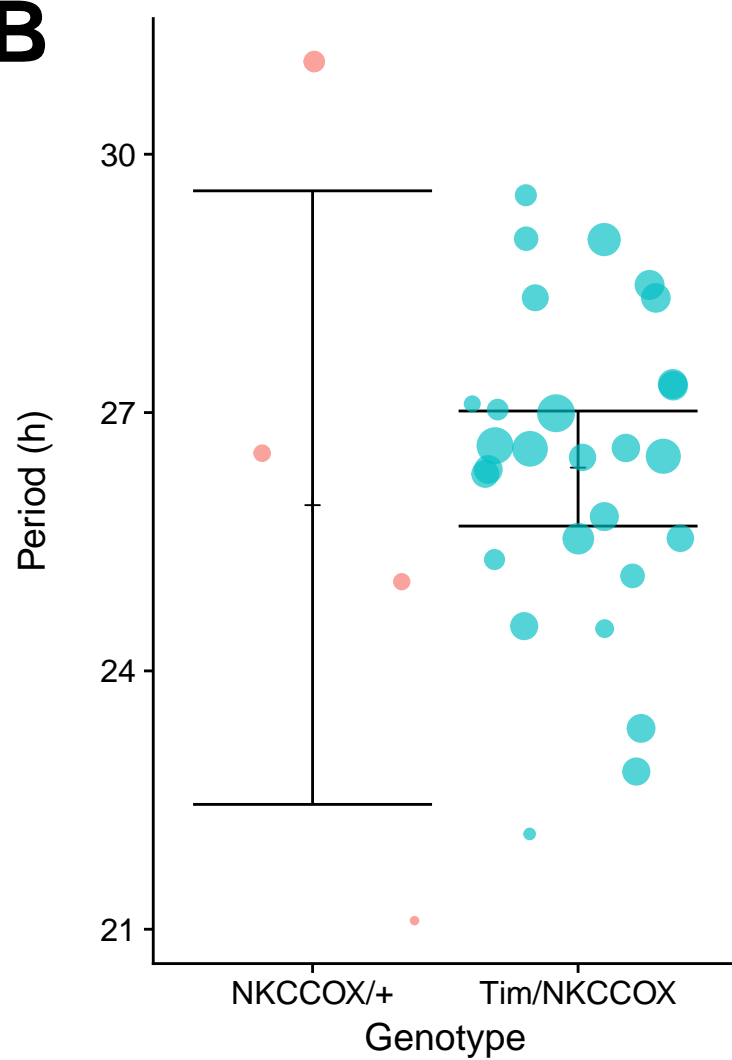
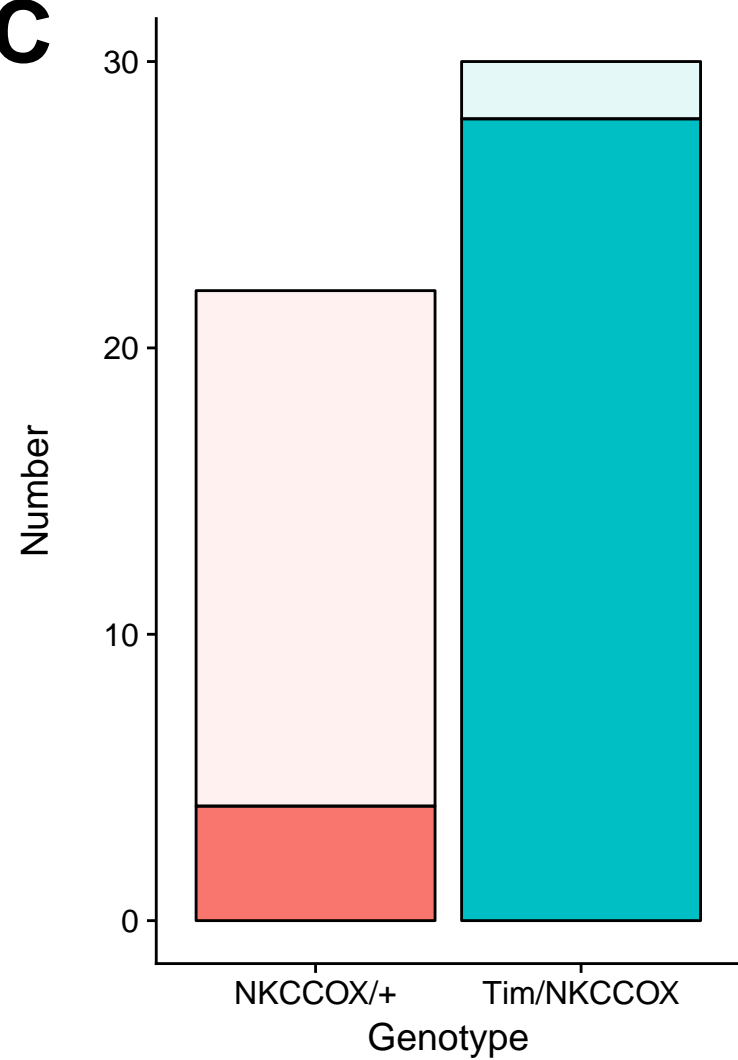
58.Tim/NKCCOX
57.Tim/NKCCOX
56.Tim/NKCCOX
55.Tim/NKCCOX
54.Tim/NKCCOX
53.Tim/NKCCOX
52.Tim/NKCCOX
51.Tim/NKCCOX
50.Tim/NKCCOX
49.Tim/NKCCOX
48.Tim/NKCCOX
47.Tim/NKCCOX
46.Tim/NKCCOX
45.Tim/NKCCOX
32.Tim/NKCCOX
31.Tim/NKCCOX
30.Tim/NKCCOX
29.Tim/NKCCOX
28.Tim/NKCCOX
27.Tim/NKCCOX
26.Tim/NKCCOX
25.Tim/NKCCOX
24.Tim/NKCCOX
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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**

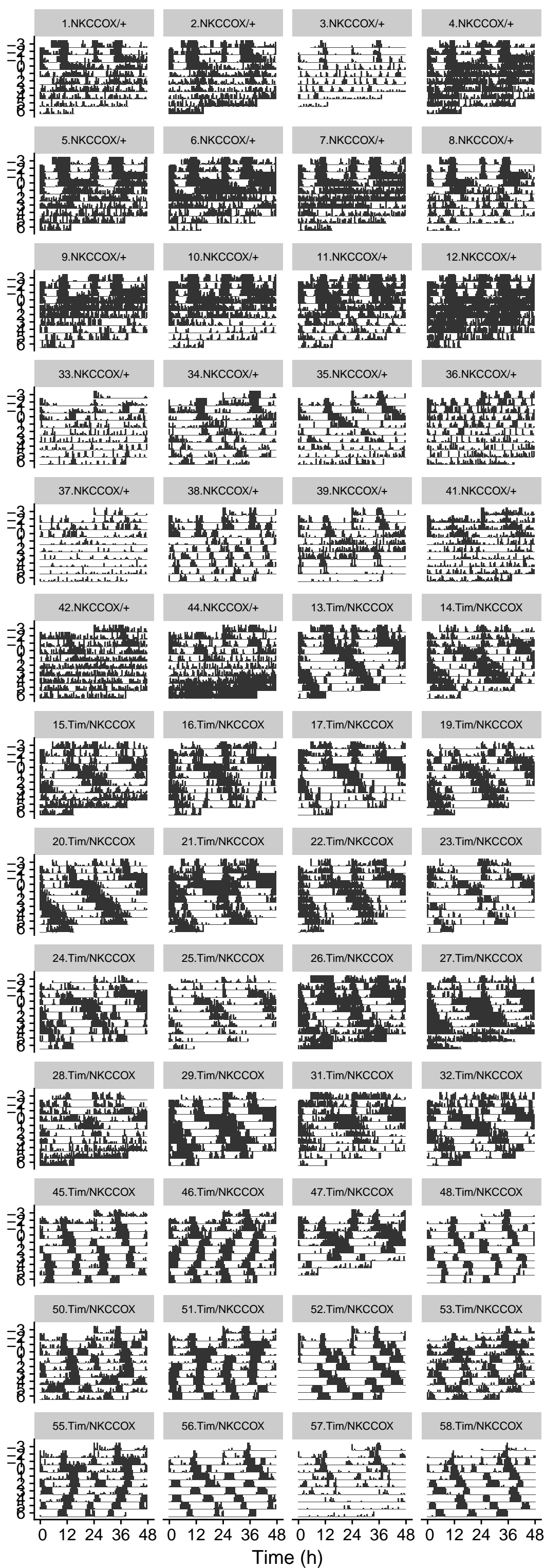
Genotype ■ *NKCCOX/+* ■ *Tim/NKCCOX*

A**B****C**

Genotype ■ NKCCOX/+ ■ Tim/NKCCOX

Peak power ● 300 ● 400 ● 500

■ Arhythmic ■ Rhythmic

A**B**