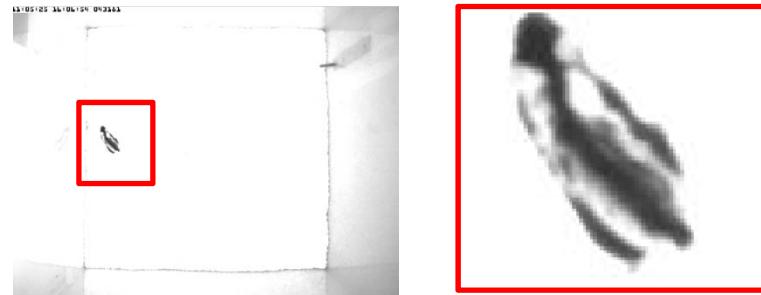


**Supplementary Figure 1**

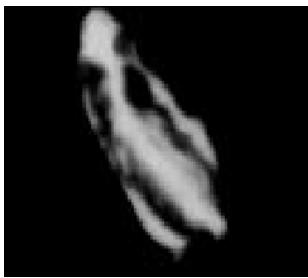
**a**



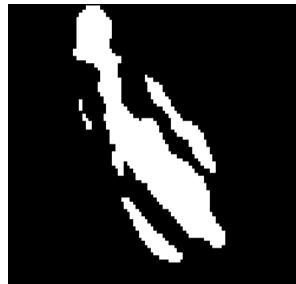
**b**



**c**



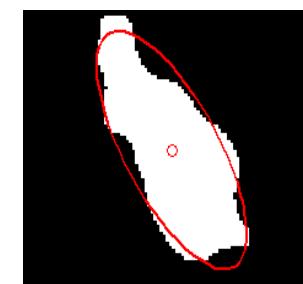
**d**



**e**

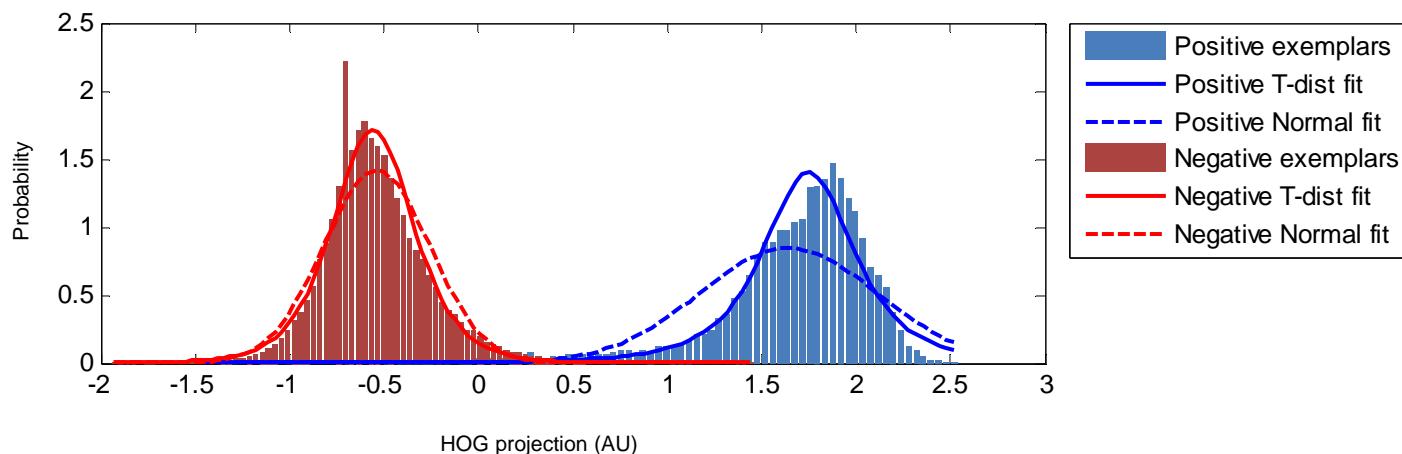


**f**

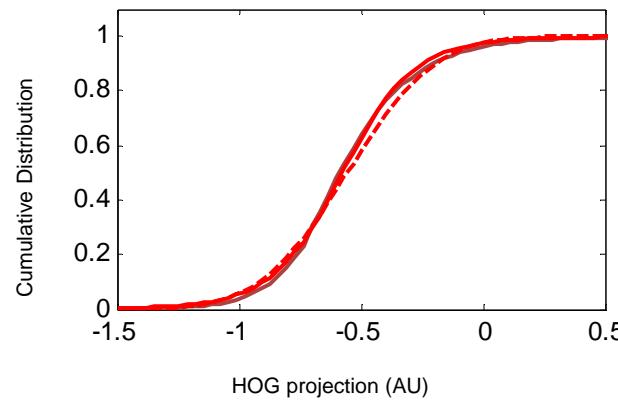
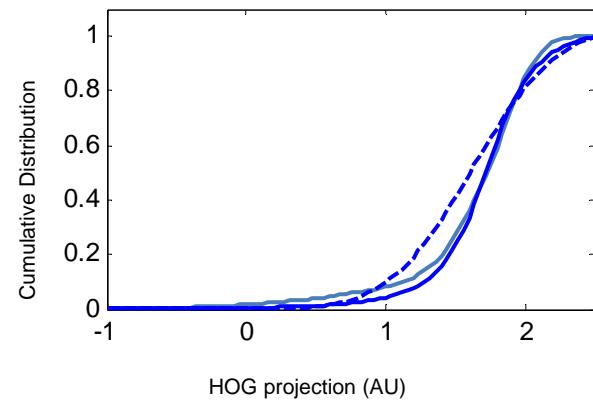


## Supplementary Figure 2

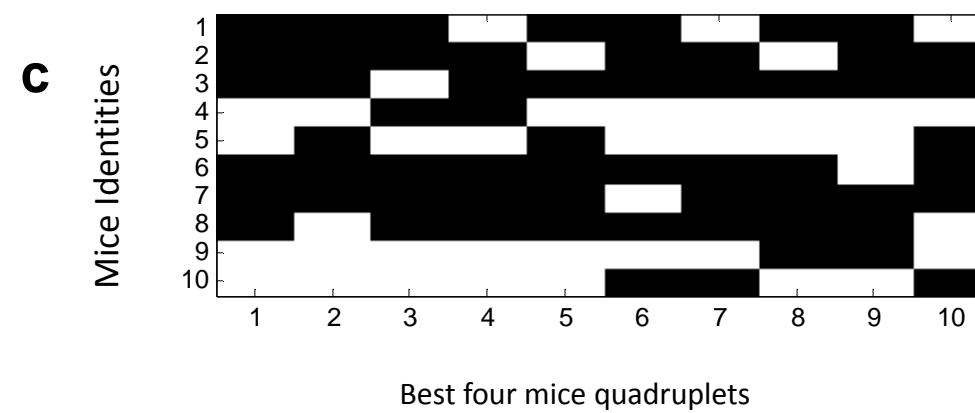
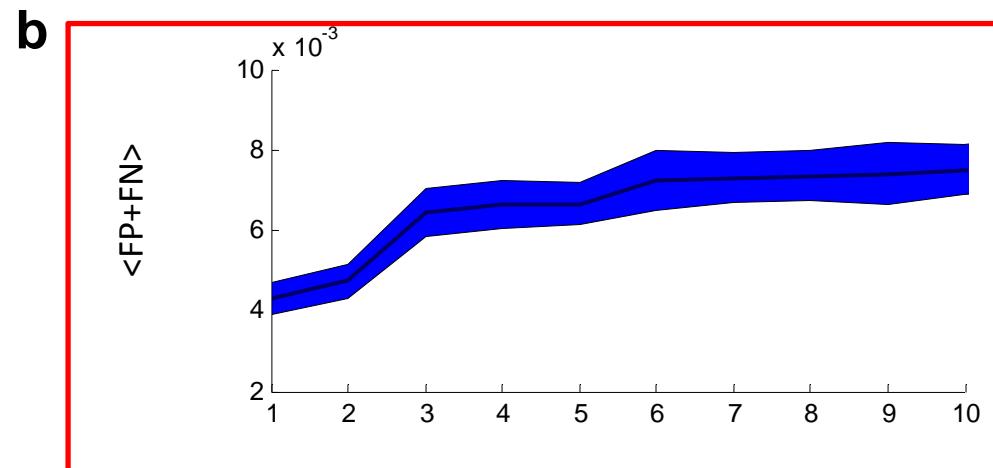
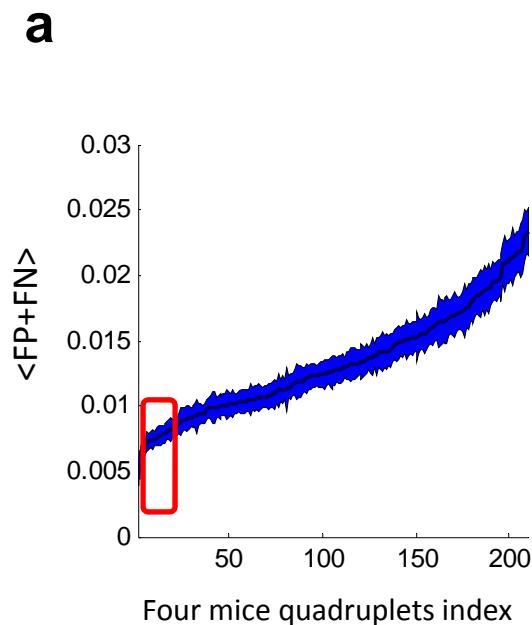
a



b



## Supplementary Figure 3



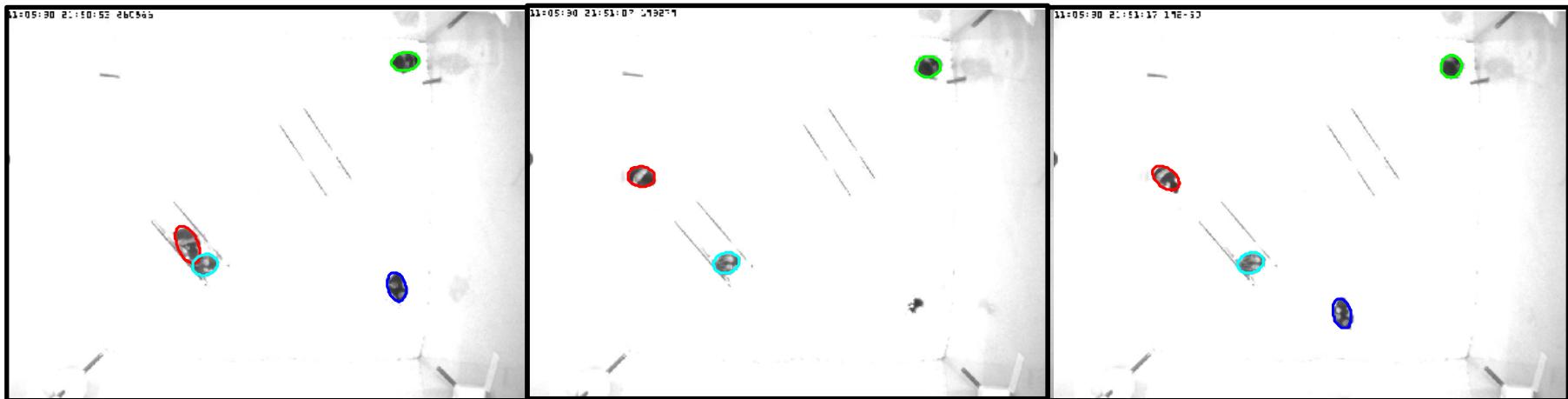
## Supplementary Figure 4

Exp 2, first dark cycle

Frame 1279483

Frame 1279883

Frame 1280183



Exp 2, third light cycle

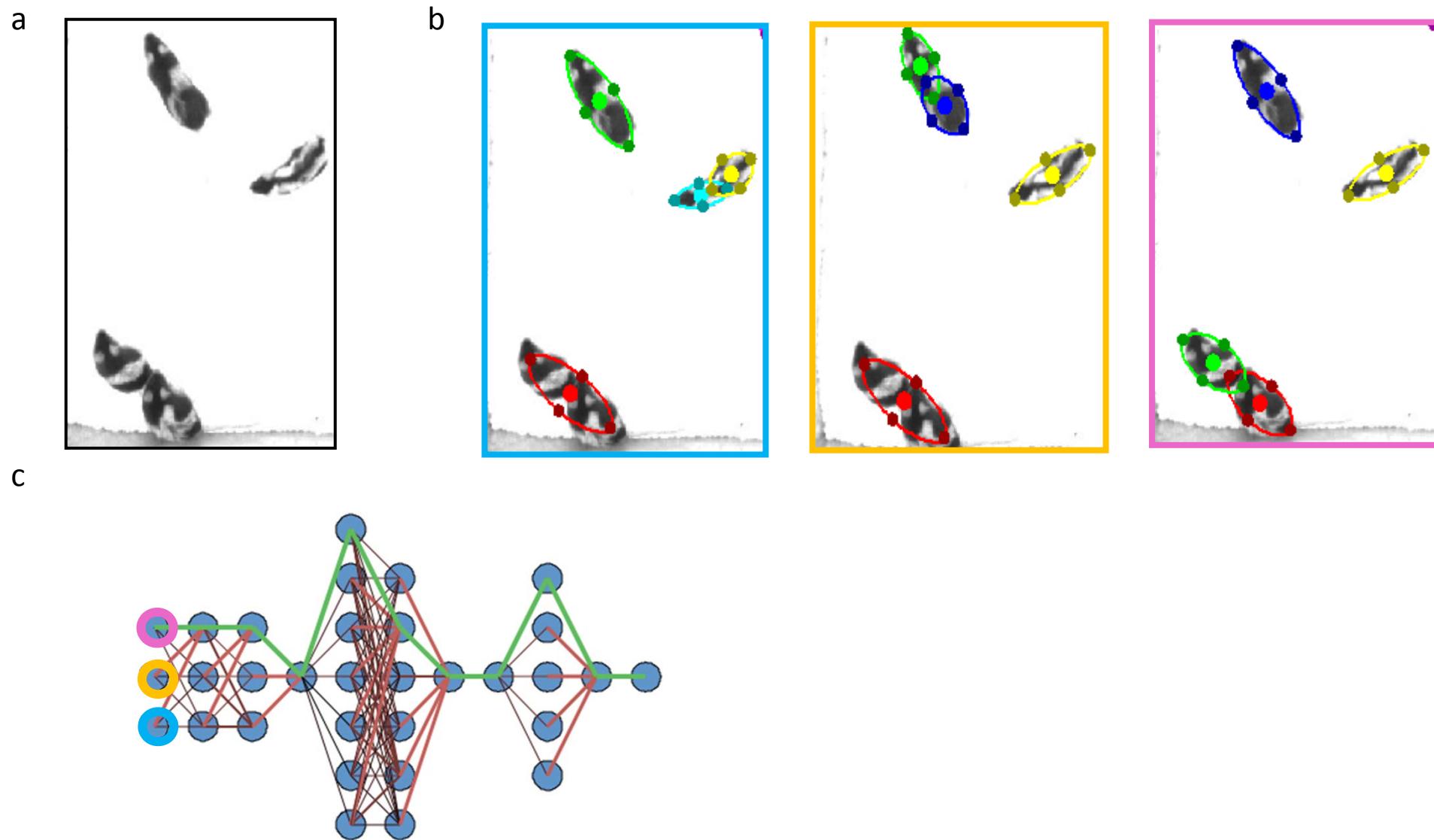
Frame 24209

Frame 24409

Frame 32589

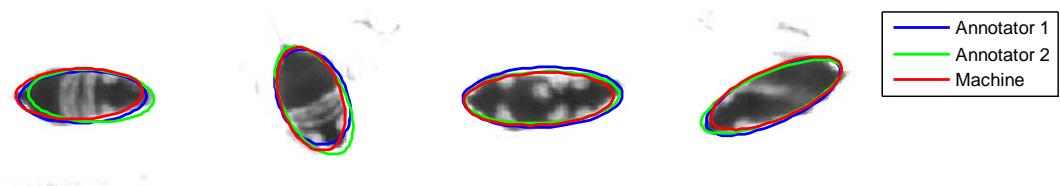


**Supplementary Figure 5**

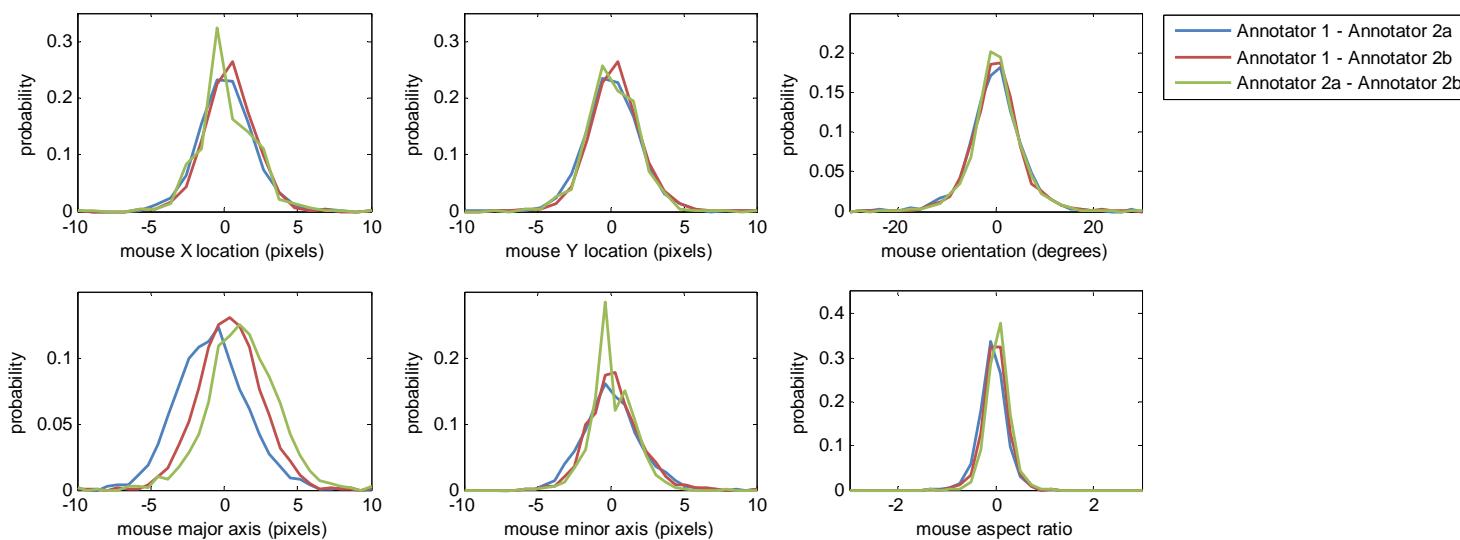


## Supplementary Figure 6

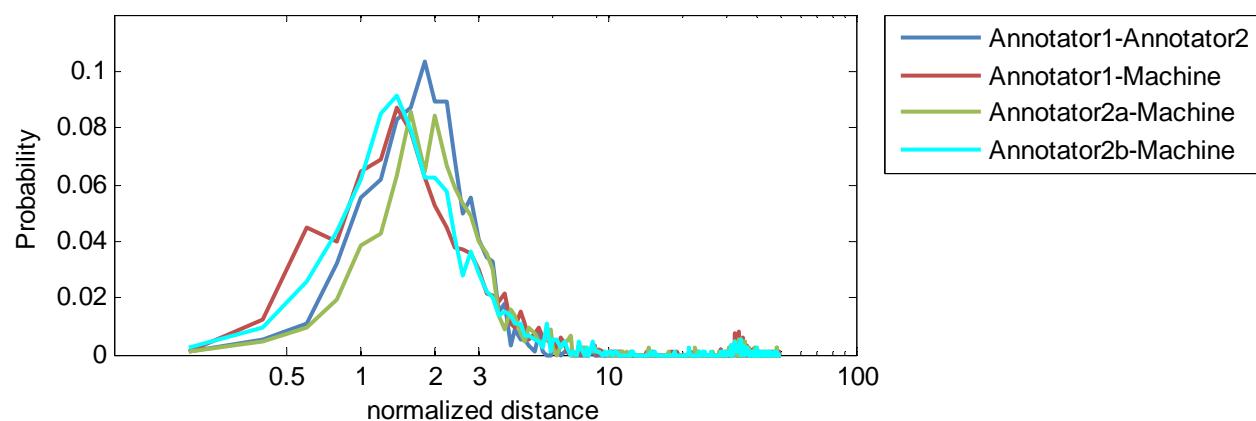
a



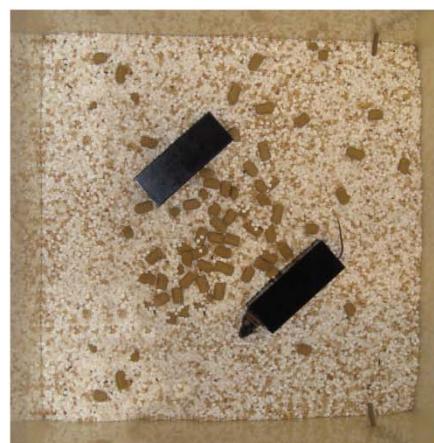
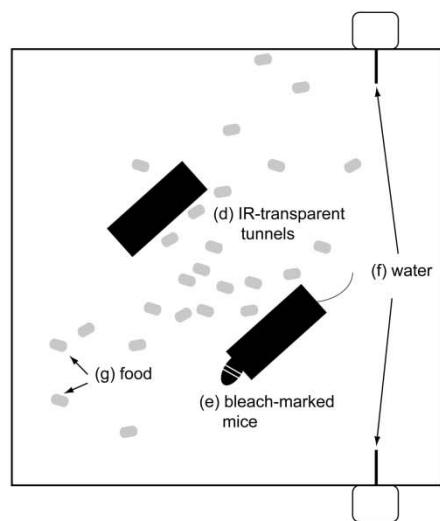
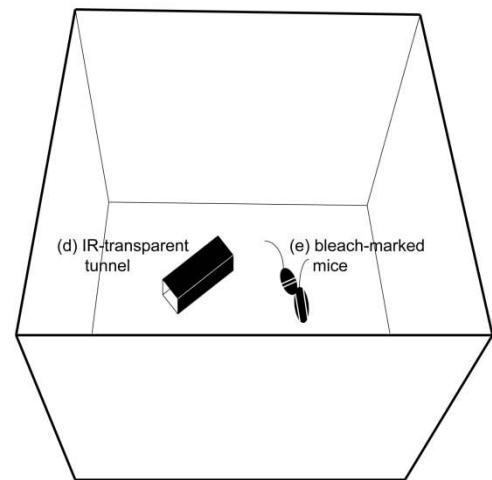
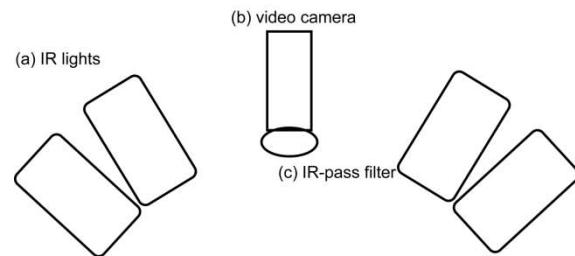
b



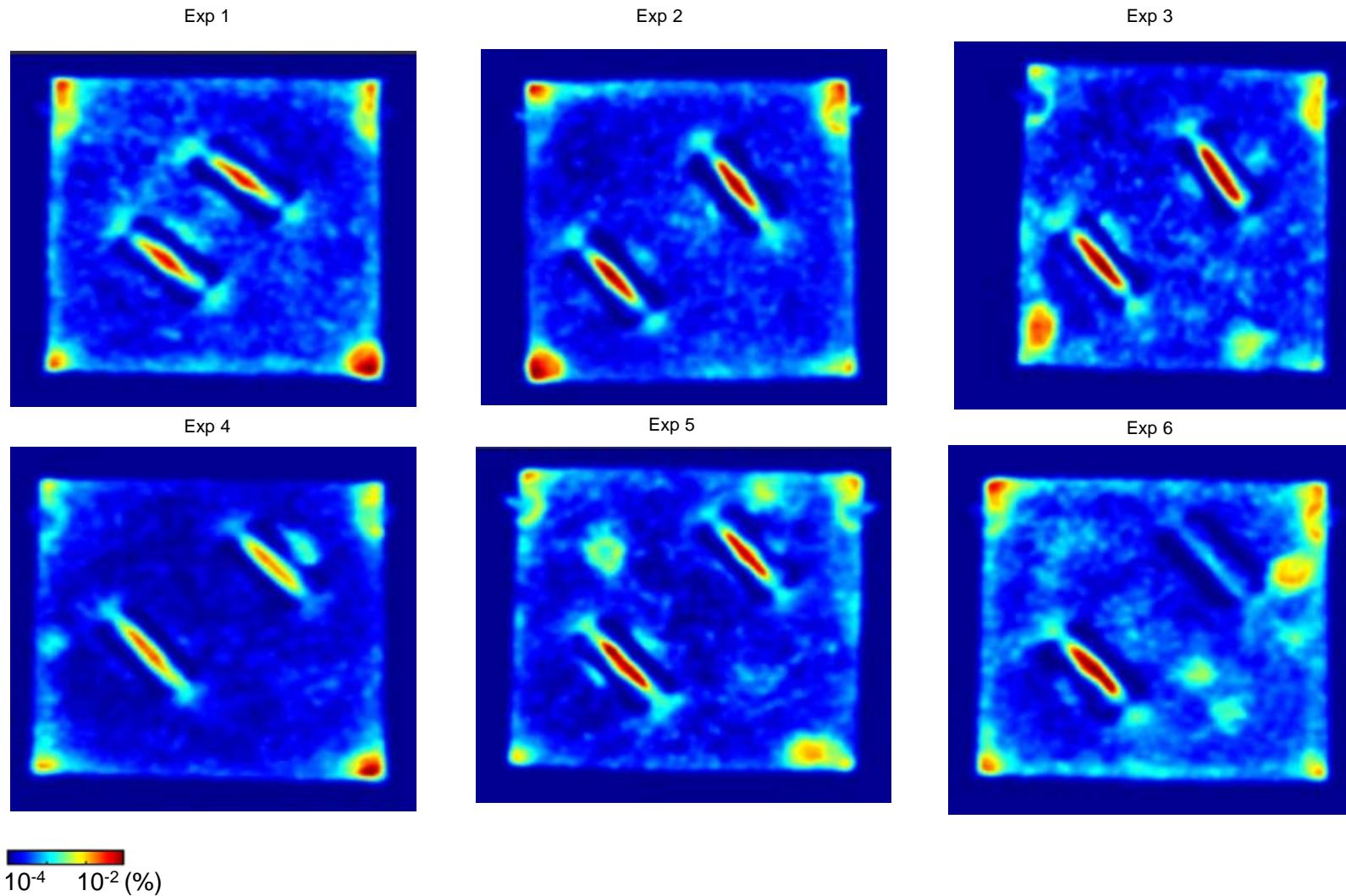
c



## Supplementary Figure 7

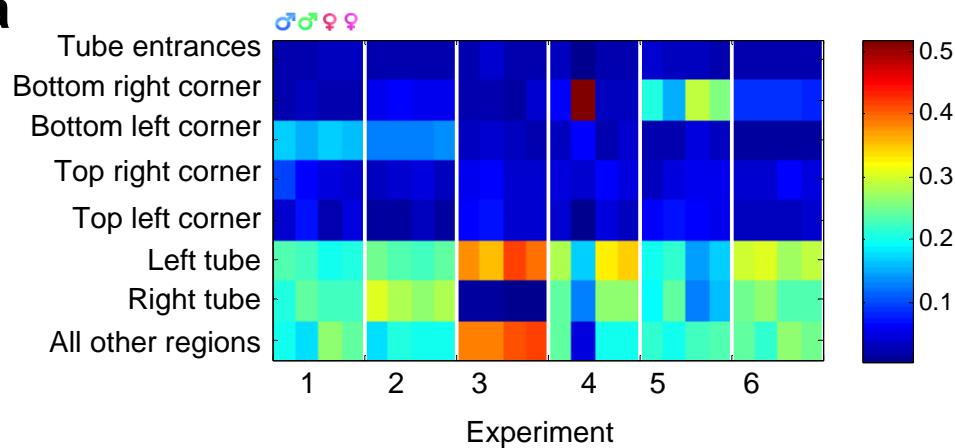


**Supplementary Figure 8**

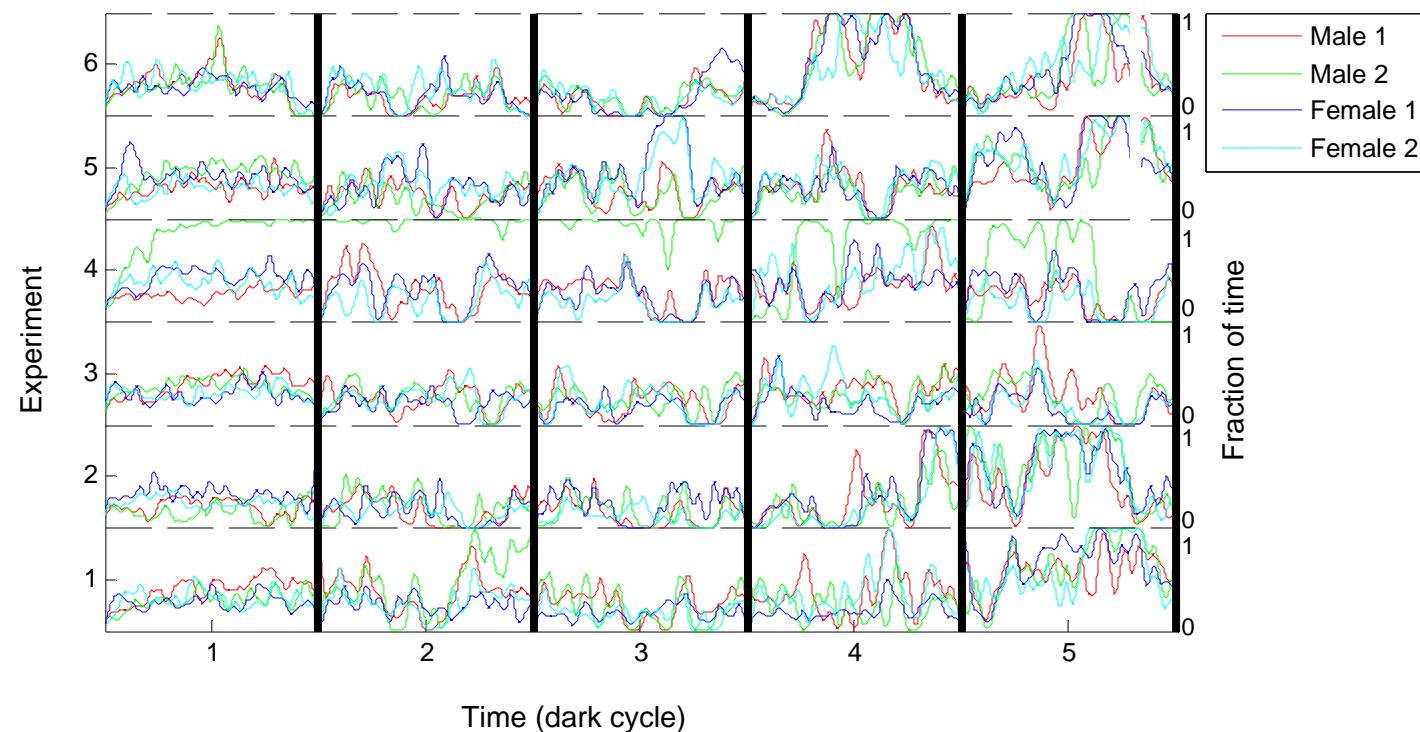


## Supplementary Figure 9

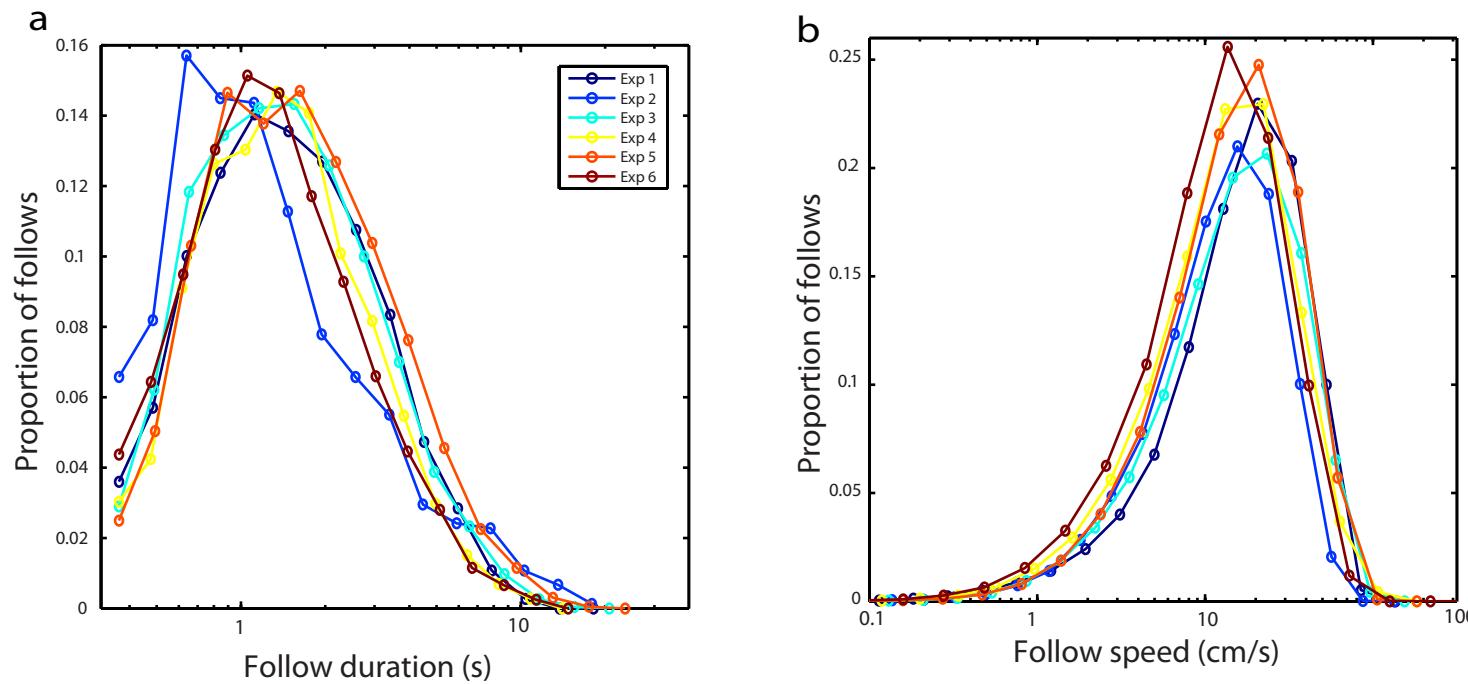
**a**



**b**



Supplementary figure 10



## Supplementary Figure 11

**a**

MouseHouse

Operations

- Train
- Track
- Results

Processing Mode

- Local
- Cluster

Experiment

/groups/egnor/home/ohayons/Code/JaneliaFarm

Single Mouse Clips

Experiment Clips

**b**

MouseHouse

Operations

- Train
- Track
- Results

Processing Mode

- Local
- Cluster

Experiment

/groups/egnor/home/ohayons/Data/cage16\_nans

Single Mouse Clips

- /groups/egnor/mousetrack/popcage\_standard/mousetrack\_16//b6\_popcage\_16\_singles.dp.seq
- /groups/egnor/mousetrack/popcage\_standard/mousetrack\_16//b6\_popcage\_16\_singles.hs.seq
- /groups/egnor/mousetrack/popcage\_standard/mousetrack\_16//b6\_popcage\_16\_singles.sp.seq
- /groups/egnor/mousetrack/popcage\_standard/mousetrack\_16//b6\_popcage\_16\_singles.vs.seq

Experiment Clips

- /groups/egnor/mousetrack/popcage\_standard/mousetrack\_16//b6\_popcage\_16\_10405\_09\_53\_16\_249.seq
- /groups/egnor/mousetrack/popcage\_standard/mousetrack\_16//b6\_popcage\_16\_10405\_09\_53\_06\_238.seq
- /groups/egnor/mousetrack/popcage\_standard/mousetrack\_16//b6\_popcage\_16\_10405\_09\_53\_38\_253.seq
- /groups/egnor/mousetrack/popcage\_standard/mousetrack\_16//b6\_popcage\_16\_10405\_21\_58\_11\_238.seq
- /groups/egnor/mousetrack/popcage\_standard/mousetrack\_16//b6\_popcage\_16\_10405\_21\_58\_13\_300.seq
- /groups/egnor/mousetrack/popcage\_standard/mousetrack\_16//b6\_popcage\_16\_10405\_21\_58\_25\_238.seq
- /groups/egnor/mousetrack/popcage\_standard/mousetrack\_16//b6\_popcage\_16\_10405\_21\_58\_37\_222.seq
- /groups/egnor/mousetrack/popcage\_standard/mousetrack\_16//b6\_popcage\_16\_10405\_21\_58\_38\_222.seq

**c**

Tune Background GUI

Left click to mark the corners of the floor. Double click inside floor to continue.

**d**

Tune Background GUI

7 out of 30 (including 30 valid frames) [Frame 10800]

Finished Marking Mice - Perform Optimization

**e**

/groups/egnor/mousetrack/popcage\_standard/mousetrack\_16/

File Jobs Algorithms

H H2

344721

Play Jump

**Supplementary Figure 12**

