1 Interbrain data analysis: one-to-one task

1.1 Description of the task and data normalization

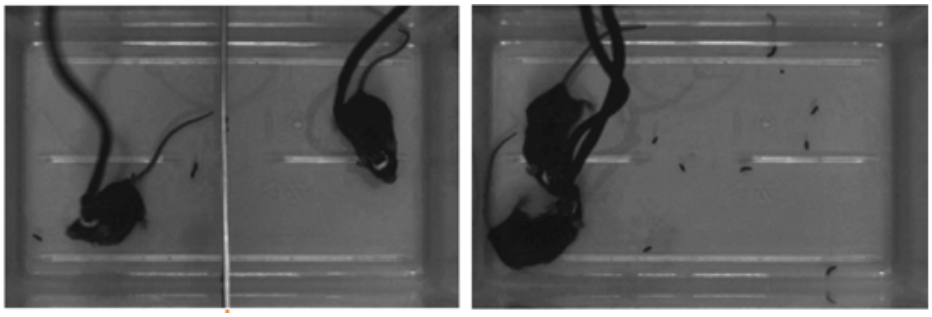

Figure 1: *Scheme of the one-to-one task. Left: situation of the pre-test and post-test phase. Right: test phase.*

In the one-to-one task, two mice are free to interact in an open arena, while the activity of somatostatine-expressing neurons in the anterior cingulate cortex is been recorded through microendoscopic calcium imaging. The task consists in three phases:

1. **Pre-test**. The mice are kept separate by a dark partition, which block their view but still allow them to sniff each other.
   $\longrightarrow$ *Duration*: 10 minutes

2. **Test**. The mice are free to interact in the arena.
   $\longrightarrow$ *Duration*: 15 minutes

3. **Post-test**. As in the pre-test, after the test the mice are separated by the same partition. $\longrightarrow$ *Duration*: 10 minutes

In contrast with the emotion discrimination task, discussed in the previous chapter, now there are only two mice which have not been subjected to emotional manipulation. Therefore, the aim of this task is to investigate neural activity and synchronization in a *standard* setting, following the work in [Kingsbury], but with a different neuronal target. Other types of data available are:

- The time instants in which reciprocal sniffing is present between the two mice, during the test

- The posotion of the micee during pre-test and post-test phases is recorded. From this, two types of zones have been labeled: one near the partition, one far from it, in order to investigate wheter, despite the presence of the partition, the proximity of the two mice could result in a difference in some of the quantities of intrest.

- Spatial data of the neurons in the ROI are present as in the case pof the emotion discrimination task

As for the normalization of the dataset, the same apporach of the previous chapter has been adopted in the one-to-one task as well, namely a z-score normalization performed on the baseline activity of neurons.