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Fiber Photometry Protocol

In 2 collections

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ABSTRACT

This protocol details collection of fiber photometry from VTA dopamine neurons.

GUIDELINES

Recordings collected with a Tucker-Davis Technologies RZ10X and TDT Synapse software.

PROTOCOL integer ID: 98223

Keywords: ASAPCRN

On every day of behavior (see Behavior protocol): 5h

1 Photobleach the mono fiberoptic patchcords (Doric Lenses Inc., MFP_400/430/1100-0.57_1mm_FCM-MF1.25_LAF) (Synapse -> Preview Mode -> Fiber Bleaching) for at least 01:00:00 , and up to 04:00:00 , in both the 415nm and 465nm channels. 5h

- This can be done the night before to save time during experimental hours

2 Use a BNC cable to connect the solenoid output circuitry (see Behavior Hardware Setup protocol) and a ground connection to one of the RZ10x BNC ports.

- Use a User Input Gizmo to record input from the correct BNC port
- This will mean that, whenever the solenoid gets a +5V signal to open from the behavior MATLAB code, the RZ10X will also record an analog +1 signal. This enables later alignment of the fiber photometry recordings with the behavior data for analysis.

3 Use the PM1 power meter (Preview Mode -> Power Meter) to check and adjust, as necessary, the LED parameters:

- The 415nm LED level should be at an amperage that produces a 20µW reading
- The 465nm LED level should be at an amperage that produces a 25µW reading

4

Note

The system is ready to record. Prior to starting a behavior session with any given mouse:

Headfix the mouse.

5 Gently clean the tips of the implanted mono fiberoptic cannula (Doric Lenses Inc., MFC_400/430-0.66_5mm_MF1.25_FLT) and the mono fiberoptic patchcord with a cotton tipped applicator soaked in 70% ethanol.

6 Dry with an air can, then connect the cannula and the patchcord using a zirconia sleeve (Doric Lenses Inc., SLEEVE_ZR_1-BK).

- Make sure the cannula and patchcord are firmly touching – if there is a gap in between, the recording performance will be low.

7 Insert the correct Mouse ID into Synapse.

8 Switch the Synapse software into Record Mode, and turn on both the 415 and 465 LED drivers.

- You will be able to clearly see light at the tip of the patchcord, even through the zirconia sleeve, when the LED drivers are on and correctly working.

9 Run the behavior session (see Behavior protocol).

- Start the fiber photometry recording before starting behavior, and end it after behavior is done, so that the entire behavior session time is collected as fiber photometry time points

10 Once the behavior session is complete, end the recording by returning the software to Idle Mode.

11 Remove the patchcord and zirconia sleeve connector from the mouse's cannula, and return the mouse to its home cage.

12 Repeat steps 4-11 with every mouse undergoing behavior.