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MEETING ABSTRACT

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Ventral tegmental area dopamine neuron activity in a closed economy and choice under chronic nicotine
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Mice were single-housed in operant boxes for the duration of the experiment while DA neuron activity was continuously recorded with a polytrode implanted in the ventral tegmental area (VTA). Food pellets were delivered after lever presses under a fixed ratio 1 schedule. Mice were primarily nocturnally active, which was also reflected in a significant increase in bursting activity during the dark vs. light period. The active lever in the operant box would either shift every 24 hours or every 4 days. In the first setting mice had to update their lever choice every 24 hours, which resulted in increased exploration of both levers and a slow evolving choice discrimination overnight, while in the second setting mice learned to discriminate both levers and focused on the active lever. We demonstrate that an increase in VTA DA activation between the lever press and reward delivery (0.5 s) appeared when a lever was associated with rewards. However, 24 hours was too short to update reward expectation and therefore both levers evoked a response. When mice were chronically treated with nicotine (drinking water or minipump 10 mg/kg/day) they displayed more exploitative behaviour by means of a significant increase in active lever presses and reduction in inactive lever presses. Next, we will apply electrophysiology to study the involvement of VTA DA activity in this phenomenon.

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