# Electrical motor evoked stimulation with recovered mouse.

(Ketamine/Xylazine edition with Antisedan antidote for faster recovery)

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Advice from Pat: The units in the table are in terms of 'ticks' in our insulin syringes so e.g. 2 ticks = 0.02 ml. In practice it is hard to dose anything finer than 0.5 tick. If the mouse is v light (~20g), we’d give it 2 ket + 1 xyl ticks. If heavier (~25-30g), it can get 2.5 ket + 1.5 xyl. I’d err on the side of caution because it is easy to overdose them and then the experiment is over. The mouse will be anaesthetized very fast if it is straight after isoflurane induction or may take several minutes if done from awake. Expect the mouse to wake up after an hour after first dose. Check for responses every 10 minutes. If you get a response, readminister 1 tick of ket and see if this is sufficient.

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| --- | --- | --- |
| Drug | initial concentration | Dosage |
| Xylazine | 2% w/v | 0.01mg/g |
| Ketamine | 100mg/ml | 0.1mg/g |
| Antisedan | 5mg/ml | 0.001mg/g |

|  |  |  |  |
| --- | --- | --- | --- |
| Weight (g) | 1:10 dilution Antisedan IP | Ket IP | Xyl IP |
| 20 | 4 | 2 | 1 |
| 22 | 4.4 | 2.2 | 1.1 |
| 24 | 4.8 | 2.4 | 1.2 |
| 26 | 5.2 | 2.6 | 1.3 |
| 28 | 5.6 | 2.8 | 1.4 |
| 30 | 6 | 3 | 1.5 |
| 32 | 6.4 | 3.2 | 1.6 |
| 34 | 6.8 | 3.4 | 1.7 |
| 36 | 7.2 | 3.6 | 1.8 |

**Goal:**

1. Can I induce a motor cortex response from sine wave electrical stimulation. Video of motor movement.

**Experiment Pre- Prep:**

1. Get the programs ready to run and check all hardware arrangements the day before.
2. Turn on the oxygen tank for the experiment area to 15psi.
3. Turn on the heat mat, turn on the lights.
4. Check the isoflurane level and fill if needed.
5. Turn on heat mat. Turn on gas canister, but not yet the motor or power up.
6. Turn on microscope light.
7. Ensure anaesthesia system is set to chamber.
8. Weight mouse and prepare Xylazine, Ketamine and Antisedan(antidote for Xylazine) based on mouse weight.
9. Prepare injectable saline syringe.
10. Place tissue in warming chamber and turn it in in preparation for mouse recovery period.
11. Place oil and some swabs out to remove band aid.
12. Prepare plastic bag bin on side of table.
13. Prepare cup electrode for reference experiments.
14. Prepare ethanol and saline to clean head bar.
15. Have replacement band aid ready.

**Experiment:**

1. Anesthetize the mouse in the induction chamber. Iso to 3%, timer 2 minutes.
2. Take mouse out of chamber, and administer IP injection of Ket and Xyl based on weight(dosages shown above).
3. Toe pinch, watch breathing rate. It should be one breath per second.
4. Fit headplate into neurotar.
5. Apply Optix care eye lube to eyes to protect them from drying out.
6. Inject mouse with 0.25ml of saline through sub-cutaneous injection.
7. Remove headplate bandaid with oil, gently lifting it off.
8. Untangle wires and connect the stim wire and reference wire to the stimulation output cable.

**run python emep\_sinewave\_test.py**

* Run at a range of output voltages. 1.5-12mA would be a reasonable range. The Tennant reported levels are really small.
* Run at a range of frequencies. (low frequency stim evokes more reliable and less variable MEP)
* Change position of reference to inside mouth with cup electrode, vs using rostral of lambda position.

**Clean Up and Power Down:**

1. Unplug electrodes and re-apply band aid after gently cleaning with ethanol.
2. Inject mouse with IP does of antisedan.
3. Move mouse to warming chamber.
4. Turn off the oxygen cylinder for experiment rig, letting it flow out of anaesthetic apparatus.
5. When mouse recovers and is moving freely return to cage.