Version 1

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Hot Water Tail Immersion Test V.1

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1 *Works for me* This protocol is published without a DOI.

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ABSTRACT

The tail immersion test measures pain response (tail flick latency) to thermal stimuli, and can be used to evaluate the effectiveness of and tolerance to analgesics (e.g. oxycodone).

PROTOCOL CITATION

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KEYWORDS

tail immersion, tail flick, rats, thermal nociception

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GUIDELINES

2 people (i.e. a dipper and a timer) are required to perform this test. Each timepoint that this test is performed must be done by the same people.

A third person is needed for the drug onboard procedure.

MATERIALS

NAME	CATALOG #	VENDOR
Water		

MATERIALS TEXT

- Water bath (Fisherbrand™ Isotemp™ GPD 02 Water Bath)
- 1000 mL beaker
- Thermometer
- Towel or pee pad

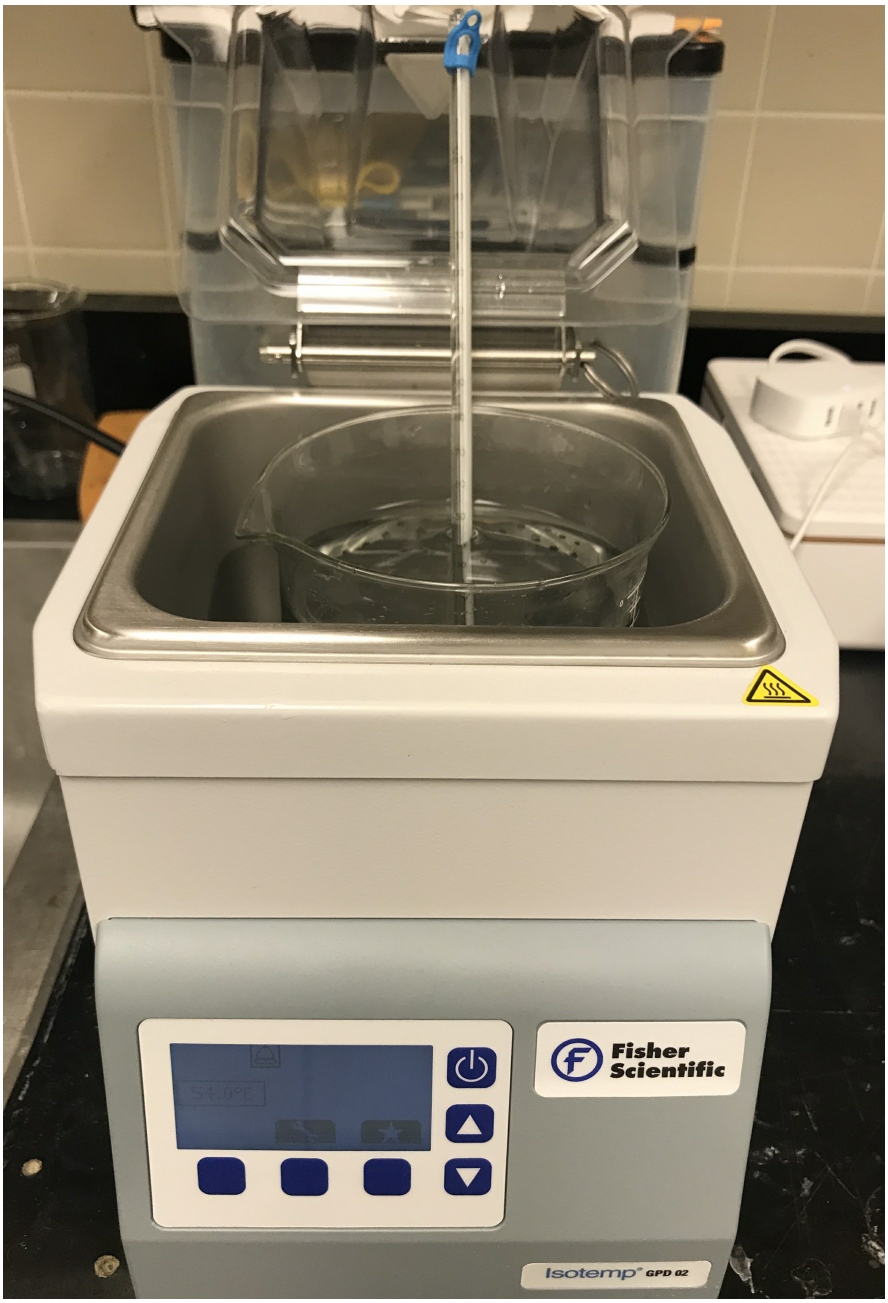
- Stopwatch

BEFORE STARTING

Set up water bath:

1. Fill approximately one-third of the Fisherbrand™ Isotemp™ GPD 02 Water Bath machine with water.
2. Fill beaker with approximately 900 mL water, then place beaker inside the water bath with the thermometer inside the beaker.
3. Place the power switch located on the rear of the machine in the **I** position. The home screen will appear displaying the set point of the water temperature which should be 54°C.
4. Press the power button on the front of the machine to turn start the bath and display the actual water temperature in the machine. Allow time for the temperature inside the beaker to reach 52°C before beginning experiment.

The set point will heat the water inside the beaker to the desired temperature for this experiment which is 52°C. Maintaining 52°C inside the beaker is critical, so keep track of this temperature by checking the thermometer frequently throughout the experiment.



Set up of water bath. Display screen shows set point of the fluid temperature in the resevoir.

General Procedure

1 Pick up rat from its home cage and wrap it in a towel or pee pad to restrain it, leaving tail exposed.

2 The dipper will hold the restrained animal over the water bath and count down before dipping 1 cm of the distal tail into the water. As soon as the tip of the tail is submerged, the timer will start the stopwatch to begin timing the rat's tail flick latency.

Animal must be relaxed with its tail being straight and still before immersing it in the bath.

3 As soon as tail flick reflex is observed, the timer will stop the stopwatch and record the tail flick latency.

Tail flick reflex is indicated as animal attempting to withdraw its tail from the water (i.e. flicking the tip of its tail up).

Do not allow more than 10 seconds to pass without observing a tail flick. Finish the procedure and record the time as 10 seconds to avoid tail damage.

4 Dry the rat's tail and return it back to its cage.

Drug Onboard Procedure (for IV oxycodone studies in rats)

5 Inject 6 animals with 0.3 ml oxycodone (0.15 mg/kg) via the IV catheter.

6 Begin a stopwatch upon infusion of the first animal:
- Every 5 minutes, inject another 6 animals as in Step 1 and repeat this step for all animals
- After 15 minutes, begin the above tail immersion procedure for the first 6 animals in the order of drug infusion

7 Perform tail immersion procedure on each successive set of animals every 5 minutes.

Work efficiently! 5 minutes should be just enough time to complete testing for each set of animals.