Two simple jigs for cutting olfactory trap components.

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The olfactory trap is a simple apparatus that can be used to measure innate and learned olfactory preferences (Woodard *et al.*, 1989). Each trap consists of a standard 1.5 mL microcentrifuge tube (the collection vial) with the pointed tip cut off, into which is inserted a cut 200 microliter pipette tip that is in turn wedged into a second tip, forming a double cone-shaped funnel (see Figure 1). During the assembly of many of these traps for use in various projects, we noticed that inconsistencies in the angle and length of the cuts could result in traps that allowed flies to escape the trap.

Figure 1. The olfactory trap apparatus. Flies enter the trap in response to olfactory cues originating from an odorant placed in the cap.

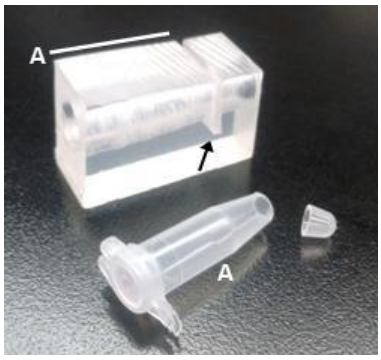

Figure 2. The microcentrifuge tube cutting jig. A 1.5 mL tube is inserted into the hole and cut at the slot indicated by the arrow. Line 'A' indicates the length of the cut.

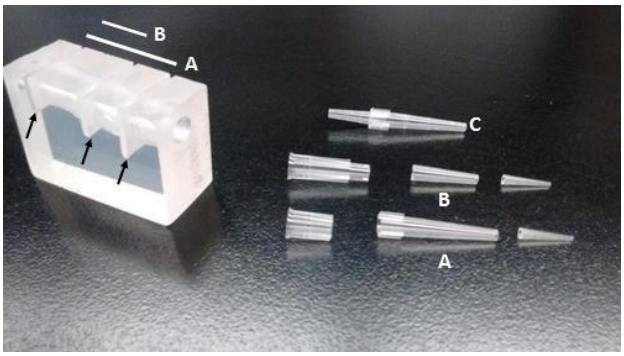

Figure 3. The pipette tip cutting jig. A 200 µL pipette tip is inserted into the hole and cut using two of the three slots (indicated by the black arrows) as guides. Two pipette tips are cut to produce the 'A' and 'B' sections, which are assembled to produce a bidirectional funnel (C). This funnel is inserted into the cut end of the microcentrifuge tube shown in Figure 2 to produce the complete trap shown in Figure 1.

Figures 2 and 3 show two jigs we now use to cut the components of the traps from pipette tips and microcentrifuge tubes accurately and reliably. The microcentrifuge tube cutting jig was made from clear ¾" acrylic stock. After cutting the stock to length, a tapered hole was bored into the block with a series of bits to accommodate the taper of the microcentrifuge tube, and a small rasp was used to smooth the taper. A single slot was then cut through the diameter of the hole to serve as a guide for cutting the tube with a razor blade (see Figure 2). The pipette tip jig was made similarly to the microcentrifuge tube jig, except that a smaller

diameter tapered hole was drilled to accommodate the smaller diameter of the tips, and two slots were cut to allow for cutting the 200 uL pipette tip into the two sizes required to assemble a trap (see Figure 3).

References: Woodard, C., T. Huang, H. Sun, S.L. Helfand, and J. Carlson 1989, Genetics 123: 315–326.

Real-time visualization software for the TriKinetics Environmental Monitor (DEnM).

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TriKinetics behavioral analysis equipment is widely used for small-insect (in particular *Drosophila*) experiments where minute by minute insect locomotor behavior can be easily monitored for days or even weeks (Rund *et al*., 2012; Cavanaugh *et al*., 2014). In the case of circadian-biology experiments, this involves changing environmental conditions and monitoring the resulting locomotor response in the animal, or monitoring how behavior changes in the absence of any entraining environmental cues (zeitgebers) (Dunlap *et al*., 2004). However, for any behavioral experiment, verifying that no confounding experimental changes occurred is prudent. For this reason, TriKinetics has developed a *Drosophila* Environmental Monitor (DEnM) which continuously monitors light, humidity, and temperature levels and records these data in real-time to a computer spreadsheet in the same format as their behavioral monitors records locomotor activity. This format is very useful for data processing, is compatible with the popular ClockLab analysis program, but is still cumbersome to get a real-time reading (*e.g.*, What is the temperature *now* inside the incubator?) or daily verification that conditions were held steady or an anticipated environmental change indeed occurred (*e.g.*, Did the one-hour light pulse occur between 3:00 A.M. and 4:00 A.M. as scheduled?) without navigating through a large multi-column spreadsheet.

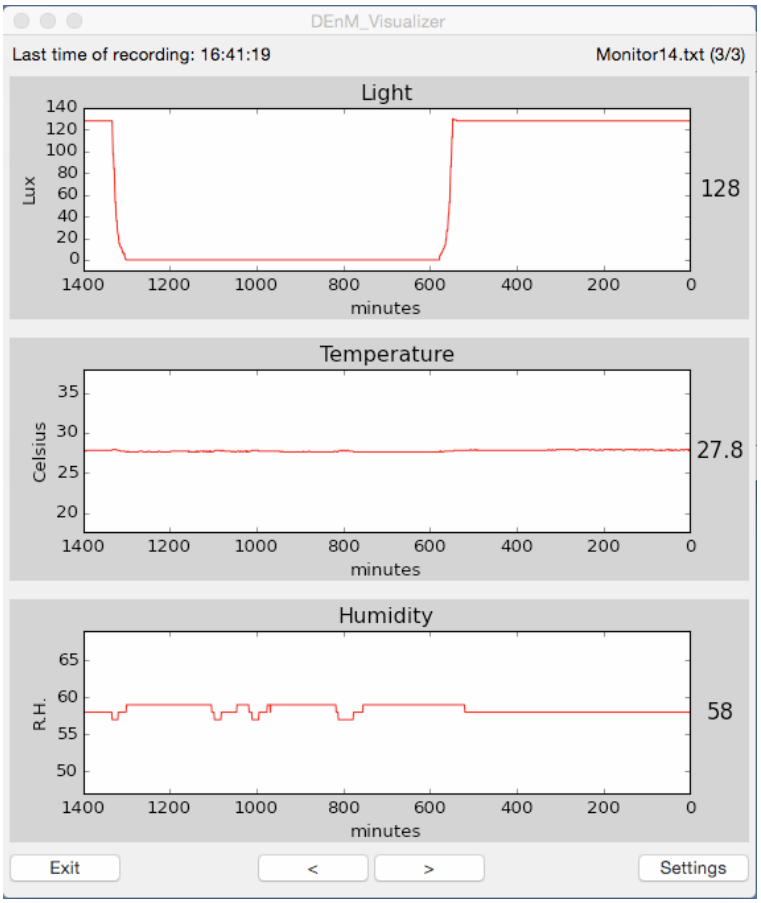

Figure 1. Screenshot of the main window of the DEnM_Visualizer program displaying the current light level (lux), temperature (Celsius), and humidity (%RH) in the incubator along with the previous 36 hours as recorded with the DEnM system.

For these reasons, we developed a tool we have called DEnM_Visualizer. DEnM_Visualizer is installed on the computer collecting data from TriKinetics units and provides real-time temperature, humidity, and light-intensity readings as