

## Microscopy101

# Making Your Own Hair Probe: A Simple Guide

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### Introduction

In our travels to meet with customers around the world, researchers often ask us how they can make their own hair probes. On an ultramicrotome, these hair probes are used to precisely manipulate thin sections of samples near the diamond knife while avoiding damage to the knife.

You might choose to make your own hair probe to get exactly the type of handle or hair that works best in your application. For example, when working with cryo-ultramicrotomes, you would need a longer handle than for room-temperature probes so that you can reach down into the cryo-chamber without getting frostbite. Making your own hair probe can also be less expensive than purchasing the commercial probes, given that a single eyelash on a handle can cost between \$12 and \$35.

Over the years, we've heard many clever ideas on hair probe construction methods. We share one here that's very simple.

### Materials

Although ultramicrotomists across the globe have their own preferences for which material to use for the handle, from

plastic drinking straws to orangewood sticks and chopsticks, we've found that many people prefer bamboo chopsticks. They are not only the right length to use in the cryo-ultramicrotome, but their beveled edges make them easier to hold firmly, and when you set them down on the table, they don't roll, as a straw or orangewood stick might.

As to the type of hair selected, many prefer a single human eyelash or a Dalmatian dog hair. The latter is excellent because Dalmatian hairs taper to an extremely fine point and have a tougher flex than human eyelashes. (Plus you get to keep your eyelashes intact!)

### Setup

The tools needed to make our simple hair probes include the following:

- a pencil sharpener (optional)
- a bamboo chopstick, which is our preference, but you can use any slim wooden handle about 6 to 8 inches long.
- a bottle of nail polish or epoxy quick-set cement that is mixed on aluminum foil or in a plastic petri dish
  - hairs (Dalmatian hair or human eyelashes)
  - a pair of fine forceps to manipulate the eyelashes

### Procedure

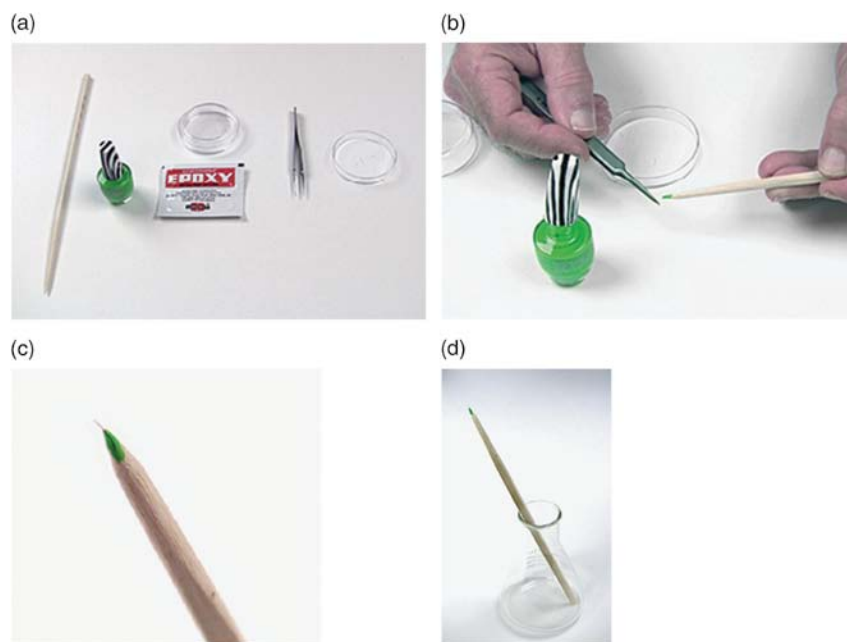
1. You can use a pencil sharpener to make a more pointed tip on the chopstick.
2. Apply a small amount of nail polish or freshly mixed epoxy glue to the end of the chopstick (see Figure 1b).
3. Using the forceps, place the root of the hair in the epoxy or nail polish, then place it at the end of the chopstick, with the tip of the hair projecting outward.

**Note:** You may want to do this under the stereomicroscope so that you can find the proper end of the hair and position it accurately on the end of the chopstick.

4. Let the chopstick dry about 30 minutes

You are now ready to use your new hair probe.

For a 10-minute video detailing these steps, as well as steps for constructing other types of hair probes and loops used in ultramicrotomy, see [https://www.youtube.com/watch?v=x\\_vkfb6e\\_WM](https://www.youtube.com/watch?v=x_vkfb6e_WM).



**Figure 1:** (a) Tools needed to make this hair probe, including (left to right) a wooden chopstick, nail polish, epoxy and a plastic petri dish, a pair of fine forceps, and a petri dish with individual eyelash hairs (or Dalmatian hairs). (b) Attaching the eyelash to the pointed end of the chopstick, which has been painted with nail polish. (c) Close-up of the eyelash attached to the chopstick. (d) Completed eyelash probe drying upright for about 30 minutes.

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