

## **Quick and cheap syringe-tubing interfacing**

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### **Why is this useful?**

The following tip describes an easy, quick and cheap way to interface syringes to 1/16" OD (outside diameter) tubing for low and medium pressure applications.

This methodology allows for very quick fabrication with off the shelf components as well as modularity since connector can be easily swapped to other syringes, in contrast to some connecting methods which require a connector fabrication for each syringe used. The connector is very easy to use.

We use 1/16" OD tubing since Upchurch's stock counts with more parts such as Y connectors, valves and else which can be interfaced with 1/16" OD tubing than with capillary or 1/32" OD ones.

### **What do I need?**

- 1/16" OD tubing
- Female Luer to 1/16" ID (inside diameter) Barbed connector. Fig. 1.
- 3M Polyolefin Heat Shrink Tubing 3/64" (HS tubing from now on)
- Heating element

### **Where do I get it and how much it will cost me?**

You can find a wide variety of tubing materials and sizes at [www.upchurch.com](http://www.upchurch.com). In particular we have used Teflon tubing (catalog number 1620), you might get 5 ft. for USD \$11.40. You could also find the connector at Upchurch (catalog number P-870) for USD \$3.25 (fabricated on TEFZEL)

A widest choice of materials for connectors is available at [www.qosina.com](http://www.qosina.com). Other materials could be cheaper than TEFZEL.

Although we have used 3M tubing (Polyolefin Heat Shrink Tubing 3/64") heat shrink tubing with ID of 1/16" should work as well. HS tubing can be alternatively found at [www.fishersci.com](http://www.fishersci.com). 20 ft. (catalog number NC9263279) sales for USD \$15.90. There are several providers for this kind of tubing. We encourage you to google for the best price.

A soldering iron would be the most common heating element. You could get a basic one from [www.fishersci.com](http://www.fishersci.com) (catalog number S50350) for USD \$10.25.

All prices consulted on June 2, 2007.

## What do I do?

Wear gloves before starting, you don't want to introduce impurities during fabrication that could contaminate your device channel in future experiments.

Cut around 1 cm of HS tubing.

Cut desired length of 1/16" OD tubing. Use scissors instead of knife (in case you don't have a special cutter) to assure a cleaner cut.

Sterilize all components with isopropanol for 2-3 minutes then blow dry.

Take the HS tubing. Insert one end to the barbed side of the connector. Make sure tubing is all the way inserted to the base of the connector (~5 mm).

On the other end insert the 1/16" OD tubing. Insert for around 2-3 mm.

Leave around 2 mm of HS tubing length between the barbed connector and the 1/16" OD tubing, it will allow you to have up to 90 degree angles between your tubing and the syringe since once HS tubing is heat shrunk will be very flexible.

Using the heating element, apply heat along all the HS tubing. Connections will further seal as tubing shrinks. Do not apply too much heat or you might melt the 1/16" OD tubing or the connector.

Finished connector should look like Fig. 2.

Done!

## Notes:

Connectors have been tested with DI water, alcohol, yeast samples, diluted YPD growth medium, air and Sodium Dodecyl Sulfate with reliable performance.

Obtained connector can be dismantled by just pulling components apart. Barbed Connectors and 1/16" OD tubing are not modified thus can be reused.



Fig. 1. Barbed to Female Luer Connector.  
From [www.upchurch.com](http://www.upchurch.com)



Fig. 2. Finished Connector.  
Picture by *Romen Rodriguez*.