

Filter Sterilization

Overview

This protocol covers filter sterilizationⁱ of solutions. Filter sterilization is used when solutions cannot be autoclaved (typically due to fragility of componentsⁱⁱ). For most purposes 0.22µm is sufficientⁱⁱⁱ.

Materials

- Syringe and syringe filters **or** bottle and bottle top filters
 - o For **volumes less than 50mL** a syringe filter should be used, whereas large volumes will require a bottle top filter. Bottle top filters are capable of filtering until clogging, so larger volumes are preferred (filters are expensive).
 - o For most applications filters made from PES (polyethersulfone) or Nylon are preferred. **When filtering organics or highly acidic or basic solutions** make sure to check the compatibility of the filter material. In general, Nylon is better at filtering organics whereas PES performs better on other metrics^{iv}
- Solution to be sterilized

Procedure

1. For syringe filtration, obtain a syringe of the appropriate size and draw up liquid. Then in the dead air box attach filter, place over sterile container and evenly push down on the plunger.^v If using a glass syringe, wash with DI and Millipore water and prepare for autoclave.
 - o When possible, use a autoclavable glass syringe instead of a plastic disposable one.
 - o Filters have different diameters, use 13mm for 20mL or less of solution, use bigger filters for larger volumes.
2. For bottle top filtration, bring a sterile bottle to the dead air box. Open the filter and screw onto the bottle. Move to the chemical hood and attach hose to vacuum and filter unit. Turn on vacuum. Add liquid (will likely need to be done in batches). Turn off vacuum. Return bottle to dead air box. Remove filter unit and screw on sterile cap.
3. Throw away filter

ⁱ Note that this will not remove viral particles

ⁱⁱ Typically fragile biomolecules e.g. thiamine, antibiotics, etc

ⁱⁱⁱ Major exception is that to filter out mycoplasma a 0.1µm filter is needed. However, this is only relevant in cell culture

^{iv} See the Corning Filtration Guide for a good overview

^v Technically, the filters work either way (i.e. you can put a filter on and suck liquid up to sterilize)