Basic Lab Skills for Working with DNA & RNA

Basic Laboratory Techniques- Pipetting

Working with DNA

Working with RNA

An Overview of Sangar and Next Gen Sequencing (NGS) approaches

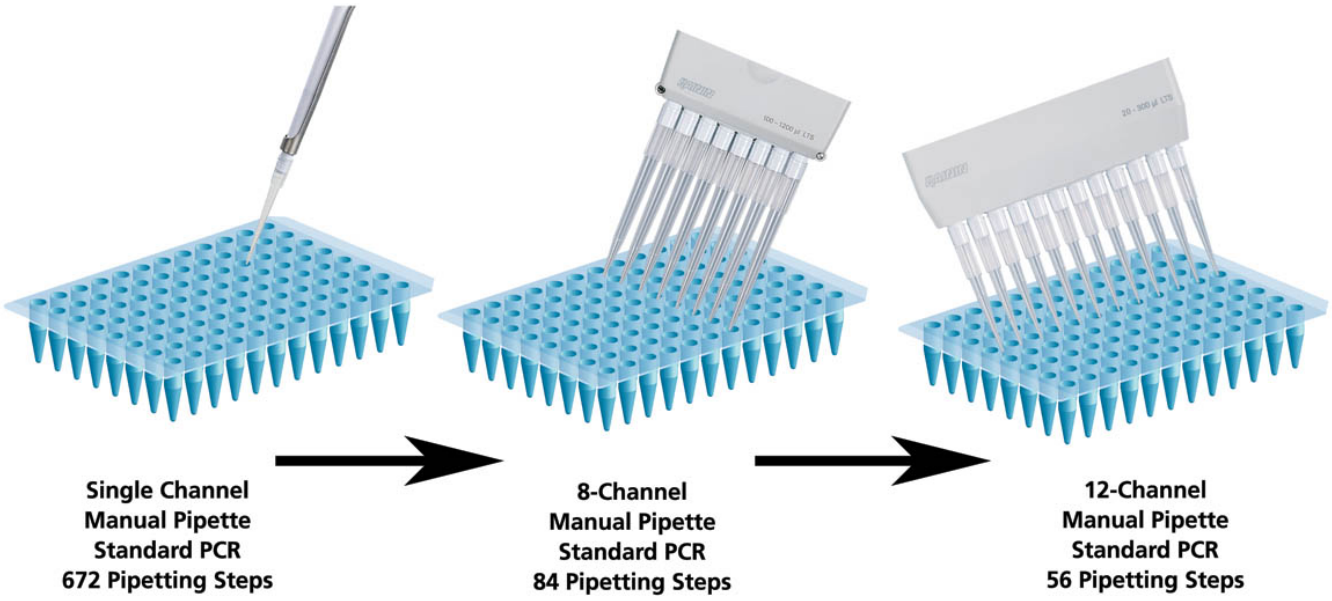
And just for fun, here's a neat little BBC video on specimen preservation and wet collections!

Basic Laboratory Equipment

Here is a short video that goes over some of the basic instruments we will be using in the lab. This video introduces each instrument and its purpose, but does not go into how to use the instruments. We will go over that next semester for each instrument.

Basic Laboratory Techniques- Pipetting

We will use both single and multichannel pipettes in the lab. As the names suggests, single channel pipettes have one channel for holding liquid, whereas multi-channel pipettes typically have 8-12 channels.

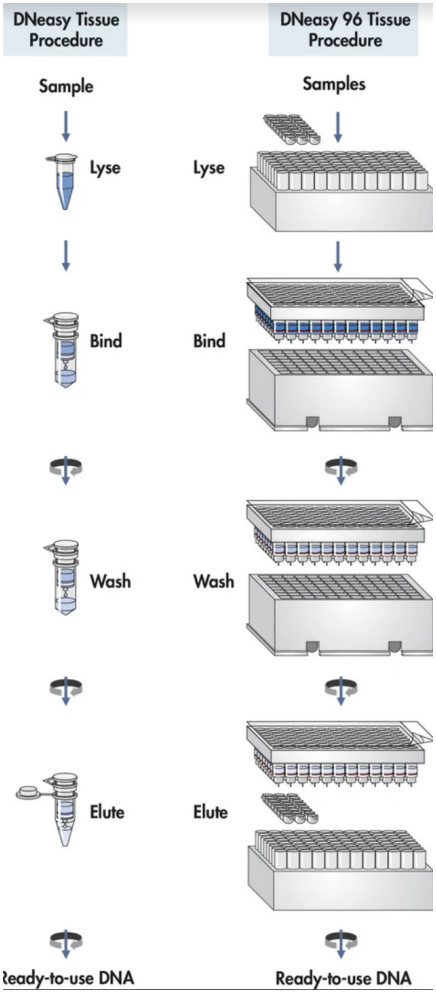


To this degree, single channel pipettes are useful for performing single transfers or loading one sample at a time for small-scale experiments, whereas multichannel pipettes are more efficient when you need to load a lot of samples. Typically, you'll always want to use a multichannel pipette when loading into either a 96 or 384 well PCR plate.

The general approach to pipetting is simple and the same for both types. The goal after all, is simply to transfer a specific amount of liquid/sample/etc. from one container to another. That said, there are some extra things to keep in mind when using a multichannel pipette to ensure you're accurately pipetting the correct amount for each sample. Here's a video showing how to properly use a multichannel pipette.

Working with DNA

Here is the basic workflow that we will use to isolate DNA from tissues. We will use DNEasy kits, which allow for quick DNA purification and isolation of either a single sample (left side of the below graphic) or 96 samples at one via a 96-well plate (right side of the below graphic).



Here is a helpful instructional video that goes over the DNEasy protocol.

And here is a link to the full protocol in case you're interested:https://drive.google.com/file/d/1Ln_f0PaidmzTMhx4ALvbq7RlHIvUObR-/view?usp=sharing

Working with RNA

Working with RNA is a little trickier than working with DNA because it is single stranded and prone to degradation from RNases. Here is a helpful video that goes over why we need to be cautious when working with RNA.

To isolate and purify RNA from tissues, we will use TRIzol™ Plus RNA Purification Kits. Here is a helpful instructional video that goes over the TRIzol protocol. The video is embedded towards the bottom of the page.

And here is the full protocol:https://drive.google.com/file/d/1S92pk5Ws2UDaRpajCUPLR8_yHGrIjLX3/view?usp=sharing

An Overview of Sangar and Next Gen Sequencing (NGS) approaches

We will likely be sending our purified samples off to be sequenced, but I wanted to include some resources on Sangar and NGS methodologies. The video below is the first in a series that addresses these topics.

And just for fun, here's a neat little BBC video on specimen preservation and wet collections!