Micropipetting

USAGE: Deliver precise volumes of liquids for scientific experiments

COMMON VOLUMES: Where 1000 µL = 1 mL and where the larger the pipette, the larger the amount of volume dispensing error

- 0.2 – 2 µL +/- 0.04 µL (P2)
- 2 – 20 µL +/- 0.16 µL (P20)
- 10 – 100 µL +/- 0.6 µL (P100)
- 20 – 200 µL +/- 1.2 µL (P200)
- 100 – 1000 µL +/- 6 µL (P1000)

COMMON TECHNIQUES:

- When delivering an easy volume of liquid (e.g. 100 µL or 500 µL) only one pipette is needed
- When delivering a complex volume of liquid (e.g. 455 µL or 202 µL) two pipettes are needed (e.g. to deliver 400 µL + 55 µL or 200 µL + 2 µL)

MICROPIPETTING PROCEDURE:

- Obtain the volume of liquid desired to be transferred. If possible, make the volume an easier volume to work with
- Determine which micropipette(s) to use, and turn the number dial slightly above the desired number (larger number) before slowly going down and stopping at the desired number
- Add the appropriate micropipette tip (sometimes you have to gently jam it in if it doesn't stay on very securely)
- Hold the micropipette vertically and press the top button until you reach the first stop (when you feel the first resistance), while gently lowering only the tip of the tip (e.g. just a little bit of the pointy part of the micropipette tip) below the surface of the liquid that you would like to transfer
- Ensure you have the second location for the transferred solution ready
- While keeping the tip of the tip completely submerged and keeping the micropipette vertical, slowly release the top button to draw up solution (don't release too fast since a solution might jump up into the micropipette and its mechanism and destroy the micropipette over time; the solution should never touch the micropipette, only the micropipette tip)
- If the solution is viscous and moves up the micropipette tip slowly, hold the micropipette in place in the solution until the solution in the micropipette tip stops moving upwards

- Transfer the solution in the micropipette to the second location by pushing on the top button to the first stop and then through the first stop to completely blow out any remaining solution in the tip
- If the same solution identity will be transferred again, and if the micropipette tip was not contaminated by a different solution, you can use the same tip to make a second solution transfer
- If a different solution identity will be transferred, or if the micropipette tip was contaminated by touching a different solution, you need to change tips before the next solution transfer
- To change tips, simply use your thumb to press on the eject tip button while you aim the tip at a used tip container for your tip size (tips can be recycled, autoclaved (sterilized), and reused)

ADDITIONAL TIPS & TRICKS

- When working with crystallization plates, work quickly but accurately because the solutions in the wells may begin evaporating, and that can negatively affect the results of the experiment (A recommended way is to seal a well as soon as you are finished with it, or seal a row or two rows of wells as soon as you are finished with it)
- When working on transferring different volumes of solutions with the same identity across a row, you can consider optimizing your pipetting procedure to minimize the number of tips you use
- When adding water to the wells, if you need to use two micropipettes, deliver the smaller volume first and then deliver the larger volume, so that you can use the larger volume pipette to begin mixing the precipitant well solution without needing a new tip (this is an example of optimizing the pipetting procedure)