Step 0. Let's get familiar with "micropipettes" (and etc.) (Day 1, 1 hr)

You need to obtain:

- Micropipettes: P20, P200, P1000

** **Tips for using micropipettes**: Note that there are two levels that you can push the button (see the Figure 3 below). When you aspirate liquid, you go 1 -> 2 -> 1. When you want to dispense, 1 -> 2 -> 3 -> 1. You might need to be gentle or slow enough not to generate bubbles and not to cause contamination of pipettes by liquid. First, you need to adjust the volume by rotating the thumbwheel. Assemble the tip with the pipette, then aspirate/dispense liquid. When you are done using tip ejector button, discard the used tip. Don't flip the pipette upside down with liquid aspirated in the tip, otherwise the liquid will contaminate the pipette. When you pipet up and down, be gentle enough so that the liquid does not reach to the pipette.

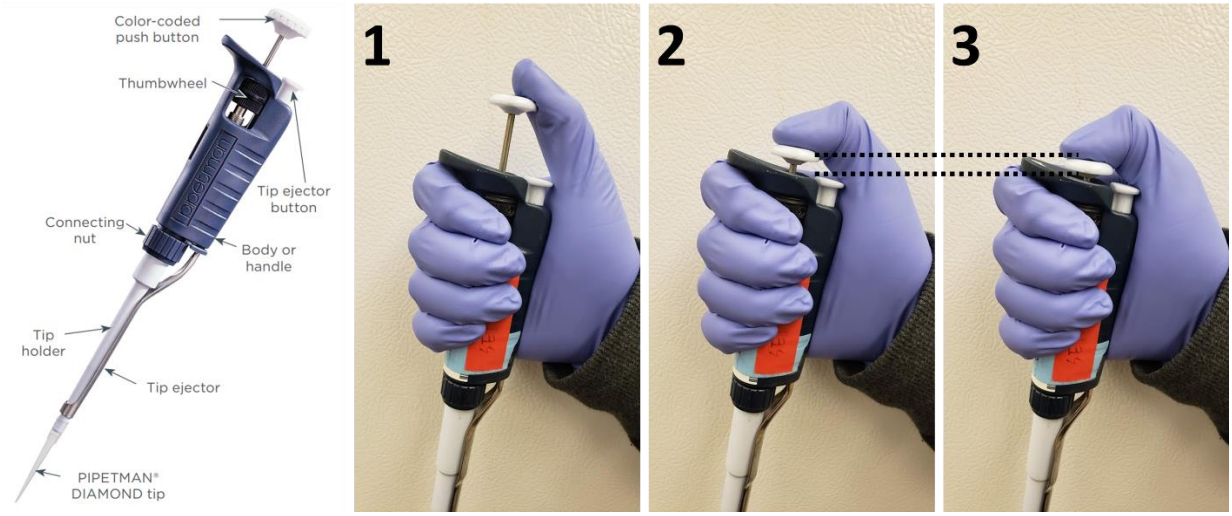

Figure 1. Description of micropipettes (left) and how to use micropipettes (right). 1: initial position of the push button, 2: aspiration position, 3: dispense position.

- 15 Weighing dishes
- Water (50 ml)
- Scales on the communal table (x2)

1. Put a weighing dish on the scale and zero. Wait until the value is stable.
2. Using P1000, pipette 1000 μl of water on the dish. Wait until the value is stable. Record the measured weight.
3. Repeat step 1 and 2 five times with new (dry) weighing dish. Get average and standard deviation of the measurement.
4. Repeat with P200 (200 μl) and P20 (20 μl). Get the average and STDEV for each volume.

Lab report questions: (include these in the 1st lab report)

1. What is the definition of "accuracy" and "precision"? What is the difference between them?
2. What is the accuracy of the pipettes? (Use the density of water at room temperature.) What is the precision of your pipetting?