

Writing and performing SOPs

Why are SOPs important in biotechnology?

What components are needed for an SOP?

A **standard operating procedure (SOP)** is a structured, step-by-step guide that ensures tasks are completed consistently and accurately. In biotechnology, where precision and reproducibility are essential, SOPs are critical for maintaining quality and safety in processes ranging from genetic testing to drug development. They outline responsibilities, required materials, and detailed methods, creating a consistent framework to produce the end products or desired results. Without SOPs, even small inconsistencies could lead to unreliable results, wasted resources, or safety issues. SOPs can be considered the backbone of any successful laboratory, ensuring that work is not only efficient but also aligned with industry standards.

To better understand the importance of SOPs, imagine the recipe for making Oreos. Just as a recipe specifies the ingredients, measurements, and steps to create a consistent product, an SOP ensures that every batch meets the same high standards. Consumers expect every Oreo to taste and look identical, regardless of where or when it was made, and that reliability comes from following strict procedures. In the same way, SOPs in biotechnology guarantee consistency, whether in manufacturing a vaccine, creating plasmid DNA for cancer research, or conducting basic lab experiments. If you enter the biotech workforce, you will find SOPs everywhere, serving as critical tools to ensure reproducibility, compliance, and the trust of those relying on the results.

Materials

For handwashing:

- GloGerm
- Sink
- Paper towels

For pipetting:

- Micropipette
- Pipette tips
- Microtube
- Tube rack
- Solution (colored water)
- Balance

Procedure

Complete a SOP by following the procedure based on your assignment.

Handwashing

1. Apply a small amount of GloGerm to your hands.
2. Wash your hands.
3. Check your hands with a UV flashlight.
4. Watch the CDC handwashing video: youtu.be/eZw4Ga3jg3E
5. Write an SOP for hand washing following the format on the SOP blank document.

Pipetting

1. Pipette 52µL of water into a microtube.
2. Check your work by using the balance (1 mL = 1 g).
3. Watch Eppendorf “How to Pipette” video: youtu.be/Wx8clzD-C04
4. Follow the procedure from the video to do the original steps again.
5. Write an SOP for pipetting following the format on the SOP blank document.