LAB SAFETY SERIES

Safely Handling Chemicals, Heat, and Microbes

In the biotech lab, students take classroom concepts and bring them to life—but with real science comes real responsibility. Whether you're working with chemicals, heat, or microbes, smart safety practices are essential. Here's how to keep your lab safe, clean, and experiment-ready all year long.

General Lab Safety Rules

These golden rules apply in every lab, every time:

- Wear PPE – Goggles, gloves, and lab coats/aprons protect your eyes, skin, and clothes.
- No food, drinks, or gum – Nothing should go in your mouth (especially pipettes!)
- Clean up spills right away – Report any accidents, especially eye or skin exposure.
- Know your safety gear – Find the eyewash station, fire extinguisher, and safety shower before you start.
- Wash hands thoroughly before leaving the lab.

Safe Chemical Handling

Even common biotech chemicals can stain or irritate—handle with care.

- Review SDS – Always check the Safety Data Sheets for safe use and disposal.
- Use gloves with stains like FlashBlue™ – They can easily stain skin and clothes.
- Choose safer tools – Use SYBR® Safe and blue light instead of ethidium bromide and UV light.
- Avoid flames near alcohol – Ethyl and isopropyl alcohol are highly flammable.
- Skip homemade polyacrylamide gels – Liquid acrylamide is a neurotoxin; use precast gels for SDS-PAGE.

Heating & Gel Electrophoresis Safety

Agarose gel electrophoresis is a core biotech technique, but it involves both heat and electricity, which require caution.

When Heating Agarose:

- Wear goggles and heat-resistant gloves.
- Microwave in short bursts and stir between intervals.
- On hot plates, use medium-low heat and monitor closely.
- Prep ahead & store molten agarose in a 60°C water bath.
  Bonus tip: Try melting agarose in a rice cooker!

When Running Electrophoresis:

- Make sure hands and equipment are dry.
- Power OFF before connecting/disconnecting wires.
- Never open the lid while the unit is running. Built-in safety helps, but personal caution is your best defense.

Handling Biological Materials

DNA, bacteria, and cells are common in the biotech lab—but must be handled respectfully and safely.

- Disinfect work areas with 10% bleach or lab cleaner before and after experiments.
- Autoclave or bleach anything that touched bacteria before disposal.
- When using human DNA or samples, don't share equipment—prevent cross-contamination.

Build a Culture of Safety

Safety isn't just for the first week—it's for every day.

- Review safety rules regularly.
- Have students sign a lab safety contract after training.
- Read SDS and prep guides before every experiment.
- Stay alert and consistent—good habits prevent accidents.

By staying prepared, staying aware, and following good lab habits, you'll create a safe and successful learning environment where students can thrive in biotechnology.

CLICK or SCAN the QR code to read the full article with Tips for Handling Chemicals, Heat, and Microbes on our EDVOTEK blog.

CLICK or SCAN the QR code to access Safety Data Sheets on our website.

Lab Safety Checklist For Chemicals, Heat, & Microbes

General Safety

- ❑ Wear goggles, gloves, and a lab coat/apron
- ❑ No eating, drinking, or chewing gum
- ❑ Use pipet bulbs—never mouth pipette
- ❑ Clean spills immediately and report incidents
- ❑ Know the location of your fire extinguisher, eyewash, and safety shower
- ❑ Wash hands before leaving the lab

Chemical Handling

- ❑ Review Safety Data Sheets (SDS) for all reagents
- ❑ Wear gloves when handling stains and solvents
- ❑ Avoid open flames near alcohols
- ❑ Use precast gels instead of liquid acrylamide

Heat & Electrophoresis

- ❑ Wear heat-resistant gloves and goggles when heating
- ❑ Microwave agarose in short intervals and stir frequently
- ❑ Keep hands and equipment dry before running electrophoresis
- ❑ Never open the lid while the electrophoresis unit is powered

Biological Materials

- ❑ Disinfect benches before and after use
- ❑ Autoclave or bleach all used bacterial materials
- ❑ Avoid sharing tools when handling human DNA or samples