

Overview of Biology Technician Role

Overview of the Biology Technician Role

(Designed as a quick-reference guide for students, career counselors, and hiring managers)

1. Core Purpose

Goal	What It Looks Like in Practice
Support scientific research	Prepare reagents, maintain equipment, and run routine assays that enable investigators to focus on hypothesis testing.
Ensure data quality & reproducibility	Follow standard operating procedures (SOPs), calibrate instruments, and document results in lab notebooks or electronic LIMS.
Maintain a safe, compliant work environment	Enforce biosafety protocols, manage waste disposal, and keep inventory of hazardous chemicals.

2. Typical Work Settings

Setting	Typical Activities	Example Employers
Academic research labs	Animal care, tissue culture, PCR, gel electrophoresis	Universities, medical schools
Government/Regulatory labs	Sample processing for environmental monitoring, disease surveillance	CDC, EPA, state health departments
Biotech & pharmaceutical companies	High-throughput screening, assay development, QC testing	biotech startups, large pharma
Clinical diagnostics	Specimen receipt, ELISA, flow cytometry, result verification	Hospital labs, reference labs

3. Key Responsibilities

Category	Specific Tasks
Sample Management	Receive, label, store, and track biological specimens (blood, tissue, microbial cultures).

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Category

Specific Tasks

Laboratory Preparation	Prepare buffers, media, and reagents; sterilize glassware; set up workstations.
Equipment Operation & Maintenance	Run microscopes, spectrophotometers, PCR thermocyclers; perform routine calibration and troubleshooting.
Assay Execution	Perform DNA/RNA extraction, PCR, qPCR, Western blots, ELISA, cell viability assays, etc.
Data Recording & Reporting	Enter results into LIMS, generate summary tables, flag outliers, maintain audit trails.
Quality Control (QC)	Run controls, verify assay performance, document deviations, participate in proficiency testing.
Safety & Compliance	Follow biosafety level (BSL?1–3) guidelines, maintain chemical inventory, complete incident reports.
Inventory & Purchasing	Track consumables, order supplies, manage stockroom organization.
Training & Mentoring	Instruct new staff or students on techniques, SOPs, and safety practices.

4. Required Knowledge & Skills

Knowledge Area	Typical Competency
Molecular biology techniques	PCR, gel electrophoresis, nucleic acid purification, cloning basics.
Cell culture	Aseptic technique, media preparation, sub?culturing, cryopreservation.
Microscopy	Light, fluorescence, and basic image analysis.
Analytical instrumentation	Spectrophotometry, fluorometry, flow cytometry, plate readers.
Laboratory safety	OSHA, CDC/NIH biosafety, chemical hazard communication (MSDS/GHS).
Data management	LIMS, Excel, basic statistical analysis, record?keeping standards.
Problem solving	Diagnosing assay failures, equipment malfunctions, and workflow bottlenecks.

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Knowledge Area

Typical Competency

Communication

Clear written notes, verbal briefings to scientists, documentation for audits.

Time management

Prioritizing multiple experiments, meeting deadlines for project milestones.

5. Typical Educational Path

Level Common Credentials Typical Content