Laboratory/Research Skills List

GENERAL LABORATORY
- Pipette
- Weigh
- Sterilize
- Filtrate
- Titrate
- Wash/Clean glassware
- Prepare media
- Practice sterile techniques

ELECTRON MICROSCOPY
- Fix
- Embed
- Stain
- Section
- Process film
- Print film
- Operation of Electron Microscopy
- Prepare grids
- Form film on grids

ANIMAL CARE
- Handle and restrain
- Weigh animals
- Breed various species
- Clean cages
- Administer injections
- Prepare special diets
- Anesthetize
- Maintain and evaluate animal records
- Prepare for sterile surgical procedures
- Perform simple surgical procedures (such as adrenalectomy)
- Assist in sterile neurosurgical procedures
- Assist in emergency medical and surgical procedures
- Administer medication
- Implant tumors into small animals
- Perform animal autopsy
- Perform microsurgery
- Catheterize and infuse small animal arteries
- Collect blood or other samples

BACTERIOLOGY
- Maintain and purify: bacteria, phage stocks, cell culture
- Cell and Tissue culture
- Culture transfers
- Inoculation
- Prepare media
- Prepare and assay bacteriophage lysates
- Pour plates
- Plasmid amplification

RADIO-BIOLOGICAL
- Radioimmunoassays
- Handle radioisotopes
- Irradiate tumors in vivo
- Label radioactives
- Radioisotope counters: autogamma, scintillation, scanning, gas flow

IMMUNOLOGY
- Plaque assay for antibody forming cells
- Hemagglutination and hemolysis assay
- Florescent antibody technique
- Lyophilization
- Spectrofluorometry
- Isolate viruses
- Cytotoxicity assay
- Lymphocyte culture

HISTOLOGY
- Routine frozen sections of whole animal brains
- Cell and fiber stains
- Perfusions of animals
- Staining processes
- Embedding processes: paraffin, celloidin
- Autoradiography of tissue sections

LABORATORY/RESEARCH INSTRUMENTS
- Light microscope
- Autoanalyzer
- Micro Burette
- pH meter
- Centrifuges: standard, high speed
- Incubators
- Dark room equipment
- Precision balance
- Volumetric glassware
- Oscilloscopes
- Blood gas analyzer
- Microtomes: paraffin, celloidin
- X-ray equipment
**BIOCHEMISTRY/GENETICS**
- Purify and characterize enzymes
- Determinations: RNA, protein, nucleic acid, phosphate and others
- Gradients: density, equilibrium, etc.
- Assays: enzyme, infectivity, blood coagulation factors, and other (biochemical) assays
- Spectrophotometers: UV, infrared, atomic absorption
- Electrophoresis: immune, acrylamide gel, paper
- Chromatography: paper, thin layer
- Column: ion exchange resins, gel, gas liquid, HPLC
- Purify blood coagulation factors
- Immunoprecipitation techniques
- Analyze peptides
- Manipulate DNA
- Extract phenols from DNA
- Equilibrium sedimentation centrifugation
- Prepare antibodies
- Analyze lipids
- Synthesize peptides
- Mutagenesis
- Test for mutations
- Cell fractionation
- Transduction
- Conjugation
- Breed and maintain a population of drosophila, rodents or other species
- Prepare and identify mutants with mutagenic chemicals

**MOLECULAR BIOLOGY**
- Agarose Gel Electrophoresis
- Cell fractionation
- Polyacrylamide Gel Electrophoresis
- Blotting techniques Ex: Western Blot

**MICROBIOLOGY**
- Use of micropipetter
- Molecular cloning
- Use of restriction enzymes
- Use of PCR (Polymerase Chain Reaction) machines
- Replica plating
- Growth of competent cells

**OTHER SKILLS/RELEVANT EXPERIENCE**
- Data processing
- Laboratory
- Statistical analysis
- Programming skills
- Database skills
- Computer languages (HTML, C++, etc.)
- Light microscopy, fluorescence microscopy, and scanning electron microscopy
- Dissection
- Molecular (gene) cloning
- Mammalian cell culture
- Restriction analysis, gel electrophoresis, and gel documentation
- UV/Vis spectrophotometry
- Enzyme-linked immunosorboent assays (ELISA)
- Design, conduct and interpret scientific research
- Isolate and analyze DNA, RNA and protein
- Sequence genomes
- Conduct statistical analysis
- Apply a scientific approach to problems
- Communicate findings using models, charts and graphs
- Communicate new research findings to lay audiences
- Communicate biological research findings using scientific writing

Adapted from The University of Memphis Career Services Office - "Laboratory/Research Skills for Science Students"