



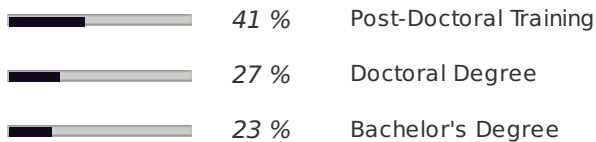
Molecular and Cellular Biologists

Description

Research and study cellular molecules and organelles to understand cell function and organization.

Education

The following is a breakdown of the top three degrees that people in this job possess (each educational level is described in the legend at the end of this document):

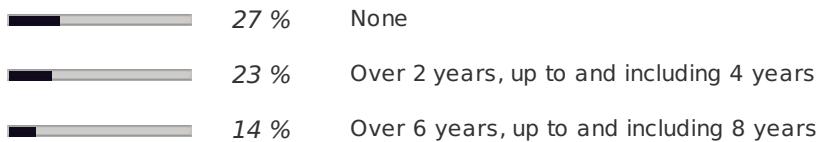


In order to pursue this career, you will need to be educated in one of the following areas:

- Molecular Biology (CIP = 26.0204)
- Cell/Cellular Biology and Histology (CIP = 26.0401)

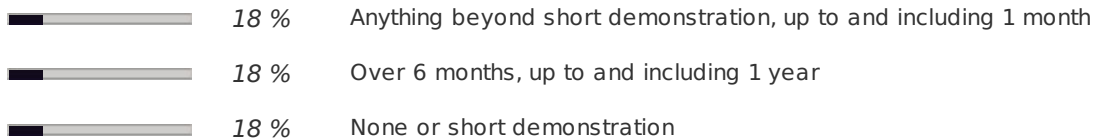
Experience

The following is a breakdown of the level of related work experience that people in this job possess:



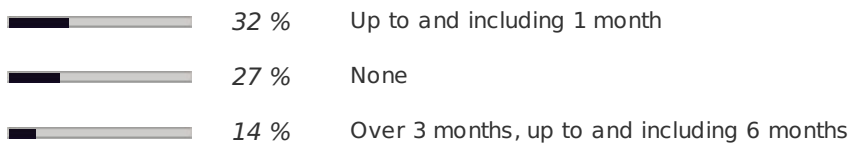
On-site Training

The following is a breakdown of the length of on-site training that people in this job typically receive:



On-the-job Training

The following is a breakdown of the level of on-the-job training that people in this job received:





Interests

The following is a list of the top three career interests (also known as Holland Codes) that people with this occupation possess, along with their level of importance to this career.

- Investigative (Very high)
- Realistic (High)
- Artistic (High)

Tasks

Here are the most common tasks and duties for which you would be responsible in this job:

- Maintain accurate laboratory records and data.
- Design molecular or cellular laboratory experiments, oversee their execution, and interpret results.
- Conduct research on cell organization and function including mechanisms of gene expression, cellular bioinformatics, cell signaling, or cell differentiation.
- Instruct undergraduate and graduate students within the areas of cellular or molecular biology.
- Compile and analyze molecular or cellular experimental data and adjust experimental designs as necessary.
- Prepare reports, manuscripts, and meeting presentations.
- Supervise technical personnel and postdoctoral research fellows.
- Direct, coordinate, organize, or prioritize biological laboratory activities.
- Perform laboratory procedures following protocols including deoxyribonucleic acid (DNA) sequencing, cloning and extraction, ribonucleic acid (RNA) purification, or gel electrophoresis.
- Develop assays that monitor cell characteristics.
- Evaluate new technologies to enhance or complement current research.
- Monitor or operate specialized equipment such as gas chromatographs and high pressure liquid chromatographs, electrophoresis units, thermocyclers, fluorescence activated cell sorters, and phosphoimagers.
- Coordinate molecular or cellular research activities with scientists specializing in other fields.
- Verify all financial, physical, and human resources assigned to research or development projects are used as planned.
- Provide scientific direction for project teams regarding the evaluation or handling of devices, drugs, or cells for in vitro and in vivo disease models.
- Conduct applied research aimed at improvements in areas such as disease testing, crop quality, pharmaceuticals, and the harnessing of microbes to recycle waste.
- Develop guidelines for procedures such as the management of viruses.
- Evaluate new supplies and equipment to ensure operability in specific laboratory settings.
- Confer with vendors to evaluate new equipment or reagents or to discuss the customization of product lines to meet user requirements.

Abilities

To pursue this career, you will need to display the following capacities:

- Written Comprehension
- Written Expression
- Inductive Reasoning
- Deductive Reasoning
- Near Vision
- Oral Comprehension
- Oral Expression
- Mathematical Reasoning
- Problem Sensitivity
- Speech Clarity
- Category Flexibility
- Information Ordering
- Fluency of Ideas
- Flexibility of Closure
- Originality
- Speech Recognition
- Number Facility
- Selective Attention
- Far Vision
- Finger Dexterity



Knowledge

To pursue this career, it would be helpful to be well-versed in the following subject areas:

- Biology
- English Language
- Chemistry
- Mathematics
- Computers and Electronics
- Education and Training
- Administration and Management
- Communications and Media
- Physics
- Medicine and Dentistry
- Engineering and Technology
- Clerical
- Public Safety and Security
- Personnel and Human Resources
- Mechanical
- Law and Government
- Design
- Psychology
- Economics and Accounting
- Geography

Skills

The following skills are considered essential to this job:

- Science
- Reading Comprehension
- Critical Thinking
- Writing
- Active Learning
- Active Listening
- Judgment and Decision Making
- Complex Problem Solving
- Speaking
- Learning Strategies
- Monitoring
- Mathematics
- Instructing
- Time Management
- Systems Analysis
- Systems Evaluation
- Coordination
- Operations Analysis
- Management of Personnel Resource
- Social Perceptiveness



Activities

In this job, you will likely spend most of your time engaged in the following activities:

- Analyzing Data or Information
- Updating and Using Relevant Knowledge
- Getting Information
- Making Decisions and Solving Problems
- Processing Information
- Documenting/Recording Information
- Interacting With Computers
- Thinking Creatively
- Communicating with Supervisors, Peers, or Subordinates
- Interpreting the Meaning of Information for Others
- Identifying Objects, Actions, and Events
- Organizing, Planning, and Prioritizing Work
- Communicating with Persons Outside Organization
- Developing Objectives and Strategies
- Training and Teaching Others
- Monitor Processes, Materials, or Surroundings
- Guiding, Directing, and Motivating Subordinates
- Estimating the Quantifiable Characteristics of Products, Events,
- Judging the Qualities of Things, Services, or People
- Establishing and Maintaining Interpersonal Relationships

Job Zone

All occupations are categorized into job zones, based on the level of preparation (experience, education, and training) that is required. There are five job zone categories, with job zone one indicating that little to no preparation is required, to job zone five, where extensive preparation is needed.

This occupation is categorized as Job Zone Five: Extensive Preparation Needed

Occupations in this job zone tend to require the following:

Experience

Extensive skill, knowledge, and experience are needed for these occupations. Many require more than five years of experience. For example, surgeons must complete four years of college and an additional five to seven years of specialized medical training to be able to do their job.

Education

Most of these occupations require graduate school. For example, they may require a master's degree, and some require a Ph.D., M.D., or J.D. (law degree).

Training

Employees may need some on-the-job training, but most of these occupations assume that the person will already have the required skills, knowledge, work-related experience, and/or training.

Example

These occupations often involve coordinating, training, supervising, or managing the activities of others to accomplish goals. Very advanced communication and organizational skills are required. Examples include librarians, lawyers, aerospace engineers, wildlife biologists, school psychologists, surgeons, treasurers, and controllers.



Legend:

Educational Levels

1. **Less than High School:** No schooling or just grade school or some high school courses.
2. **High School Diploma:** Or GED or High School Equivalence Certificate.
3. **Post-Secondary Certificate:** Awarded for training completed after high school (for example, in Personnel Services, Engineering-related Technologies, Vocational Home Economics, Construction Trades, Mechanics and Repairers, Precision Production Trades).
4. **Some College Courses:** Can consist of college preparatory courses or regular courses taken while attending college, but credits attained are not sufficient to get a degree.
5. **Associate's Degree:** An undergraduate degree awarded by a junior, community technical or bachelor's degree-granting college/university. Requires a completion of a two-year course of study.
6. **Bachelor's Degree:** An academic degree awarded for an undergraduate major or course. Requires a completion of a four-year course of study.
7. **Post-Baccalaureate Certificate:** Awarded for completion of an organized program of study; designed for people who have completed a Baccalaureate degree, but do not meet the requirements of academic degrees carrying the title of Master.
8. **Master's Degree:** An academic degree awarded to people who, in addition to achieving a bachelor's, have taken additional courses or completed a research study in a specific field or subject area. Requires an additional one to three years of study.
9. **Post-Master's Certificate:** Awarded for completion of an organized program of study; designed for people who have completed a Master's degree, but do not meet the requirements of academic degrees at the doctoral level.
10. **First Professional Degree:** Awarded for completion of a program that: requires at least 2 years of college work before entrance into the program, includes a total of at least 6 academic years of work to complete, and provides all remaining academic requirements to begin practice in a profession.
11. **Doctoral Degree:** An academic or professional degree awarded for the completion of advanced graduate study beyond a Master's degree. Requires an additional two to four years of study.
12. **Postdoctoral Training:** Consists of advanced academic research completed after doctoral studies. Generally done within five years of the completion of a Doctoral Degree in order to deepen a person's knowledge of a particular subject, hone skills, and publish academic papers.