



ET-2004-10-145-ARC

# **Educational Topic**

# **Molecular Biologist**

# **Related Job Titles:**

Biologist, Life Scientist, Medical Scientist, Geneticist, Biochemist, Physiologist

### Job Description:

Molecular Biologists study how genes in cells cause biological characteristics and function in organisms. They study the detailed genetic make-up of plants, animals, humans, bacteria, and fungi. They study nucleic acids (DNA and RNA) for medical testing for disease-causing organisms and to test for inherited human genetic disorders. Molecular biologists are also important in industry for developing new lines of plants, animals and micro-organisms, or aid in the development of new medicines. Molecular biologists often work long hours in traditional environments such as laboratories, offices, or universities where they conduct research and a variety of experiments, write and publish papers, or teach.

#### Interests / Abilities:

- Do you like to examine things under a microscope?
- Are you good at observing and then reporting what you see?
- · Can you clearly communicate your ideas to others?
- Do you like to help other people?
- Do you pay attention to details and enjoy working accurately?
- Are you able to concentrate or work continuously for many hours?

# Education / Training Needed:

The minimum education required for this position is a bachelor's degree in Biology, Microbiology, Biochemistry, or related field from an accredited college or university. This level general does not involve research and generally involves assisting others in testing and observation. A master's degree is required for applied research and managerial positions. A Ph.D. degree is usually necessary for independent research and several years of research and post-doctoral work are generally required.

#### Suggested School Subjects / Courses:

- Biology (biochemistry, genetics, microbiology, immunology)
- Chemistry (organic, physical, inorganic)
- Mathematics
- Laboratory research and fieldwork
- Writing and speech

# Areas of expertise:

- *Genetics:* understand the inheritance of genetic diseases and provide counseling to families
- Criminology: provide law enforcement with evidence (such as DNA) to help solve crimes
- Agriculture: manipulate genetic makeup to breed new crop plants or livestock
- *Pharmaceutical:* study of molecular structure to design new medicines

#### Additional Resources:

- American Society for Microbiology http://www.asm.org
- Astrobiology Summer Academy http://academy.arc.nasa.gov/
- DNA Learning Center http://www.dnalc.org
- Genome Research Institute http://www.genome.gov
- Graduate Student Researchers Program http://spacelink.nasa.gov/Instructional.Materials/NASA.Educa tional.Products/Graduate.Student.Researchers.Program.Brochur e/.index.html
- MATHCOUNTS Competition http://mathcounts.org/
- Minority University Research and Education Programs http://mured.nasaprs.com/

 NASA Cooperative Education Program for college students http://spacelink.nasa.gov/Educational.Services/ NASA.Education.Programs/Student.Support/NASA.Cooperative .Education.Program/.index.html

- NASA Fundamental Space Biology Outreach Program http://weboflife.ksc.nasa.gov/index.htm
- NASA Jobs http://nasajobs.nasa.gov/
- NASA Office of Biological and Physical Research http://spaceresearch.nasa.gov
- NASA SHARP Internship Program for highschoolers http://www.mtsibase.com/sharp/

#### What can I do right now?

- Take summer jobs or internships at parks, laboratories, museums or camps.
- · Read books on biology and genetics.
- Borrow or buy a microscope and look at samples you have collected from soil or water.
- Construct a family tree and research your family medical history.
- Join a local biology club or organization.
- Read the book, *The Cartoon Guide to Genetics* by Larry Gonick (ISBN: 0062730991).
- Information on careers in biochemistry and biological sciences: Federation of American Societies for Experimental Biology 9650 Rockville Pike Bethesda, MD 20814 http://www.faseb.org
- NASA Student Employment http://nasajobs.nasa.gov/stud\_opps/employment/index.htm
- NASA Student Involvement Program student contests
  http://www.nsip.net/index.cfm
- Student's Guide to Astrobiology http://www.astrobiology.com/student.html
- Tech-Interns.com http://www.tech-interns.com/





http://quest.nasa.gov/people/index.html

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