

Fields of Biomedical Research & Related Careers

Cardiologists research disorders of the heart and blood vessels and develop life-saving drugs and surgical techniques such as pacemakers and artificial heart valves.



Immunologists study the body's defense mechanisms against viral or bacterial invasions and develop preventative vaccines and treatments.



Geneticists study heredity, genes, and DNA. Stem cells and genetically modified organisms are areas of such research.



Pulmonologists research ways to treat diseases of the lungs and airways such as lung cancer, pneumonia, pleurisy, asthma, sleep disorders (which often affect breathing), and emphysema.



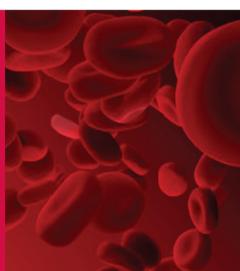
Hematologists research ways to treat diseases of the blood, spleen, and lymph glands, such as anemia, sickle cell disease, hemophilia, and leukemia.



Neurologists research ways to treat all disorders of the nervous system, including the brain, spinal cord, nerves, and the structures that support them.



Cell Biologists study cell composition, structure, and function to understand how the molecules that make up cells work together to produce functional cells, and how cells work together to make tissues and organs.



Transplant surgeons and veterinarian surgeons research how organs can be transplanted from human to human, from animal to animal, and in xenotransplantation, from animal to human.



Pharmacologists create new compounds and study the interaction of drugs on the systems and processes of living animals for therapeutic and other uses.



Pathologists analyze the biochemistry of the body to detect and monitor disease and explore the causes and nature of disease.

Career Opportunities

Minimum Requirements/Conditions

	High School Diploma	College Degree (2 & 4 years)	Graduate Degree	Certification Possible or Required	Work with Animals	Indirect Work with Animals
Animal Behaviorists study animals to collect data on their behavior and activity.		●			●	
Animal Care/Laboratory Animal Technicians provide food and water, clean housing, and enrichment for laboratory animals and monitor animal health on a daily basis.	●			●	●	
Animal Facility Supervisors oversee the animal facility setting, ensuring that all laws and regulations are followed.	●	●		●	●	
Animal Health Technicians monitor animal health and provide medical care as prescribed by a veterinarian.		●		●	●	
Biomedical Engineers work in the practical application of engineering as it relates to health and medicine.		●		●	●	●
Cagewashers and Facility Maintenance personnel keep research facilities and equipment clean, dependable, and safe.	●				●	●
Clinical Trials Associates organize the testing of new drugs and technical procedures on humans.	●					
Computer Scientists and Programmers create and design programs for use in research.		●				
Engineers design and create equipment, facilities, devices, and materials used in a research environment.		●				●
Laboratory Assistants help technicians, veterinarians, and researchers in the laboratory setting.	●			●	●	●
Laboratory Veterinarians provide medical care to animals, perform independent research, and serve as consultants and collaborators to research investigators.				●	●	●
Medical Doctors provide medical care to humans, work on advances in medical procedures and surgical techniques, and discover new drugs and medical treatments.				●	●	●
Medical Technologists perform laboratory tests in medical and hospital diagnostic laboratories.		●		●		
Nutritionists design healthier diets for animals and humans and study food-borne illnesses.		●		●	●	●
Pharmaceutical Technicians assist researchers in discovering and creating new medicines.		●			●	●
Pre-Clinical Trials Associates work with scientists testing new drugs and procedures on animals prior to testing on humans.		●			●	
Regulatory Affairs Specialists maintain and enforce the laws and rules that govern the use of animals in all areas of research.		●				●
Research Associates/Laboratory Technicians work with scientists, doctors, and vets in laboratories assisting in experiments, analyzing data, and maintaining equipment.	●	●		●	●	●
Researchers/Scientists study medical conditions and conduct experiments in all fields of biomedical research to develop new medical techniques, devices, treatments, and medicines. Look around the edges of the chart for some examples!				●	●	●
Statisticians use computers to help researchers design experiments and analyze the results.		●				
Technical Writers record and publish the results of research, the protocols for research, and the specifications and procedures for using new medicines and surgical advances.		●				
U.S. Department of Agriculture Inspectors are responsible for inspecting farms, meat packing facilities, zoos, and medical research facilities to ensure that all federal laws are strictly upheld.				●	●	●
Veterinary Technicians assist veterinarians with veterinary care. They can work in private animal clinics, animal hospitals, zoos, or research facilities.		●		●	●	



Research Veterinarians research the diseases and conditions associated with domestic pets, livestock, and wild animals and develop vaccines, treatments, and cures.



Toxicologists study toxic substances and their effects on organisms, helping people and animals that have been poisoned by household or industrial toxins, environmental toxins, and prescription and nonprescription drugs.



Microbiologists research the causes of disease such as viruses, bacteria, fungi, and parasites.



Endocrinologists research disorders of the endocrine system and related conditions such as diabetes, obesity, and thyroidism.



Oncologists research ways to treat and cure all types of cancer, in humans and in animals.



Careers in Biomedical Research



Accept the Challenge to Care

What is biomedical research?

Biomedical research is the broad area of science that is undertaken to gain knowledge and understanding of the biological processes and the causes of disease. Biomedical research is an evolutionary process that requires the input and participation of many professionals. Through careful experimentation, laboratory work, analysis, and testing, biomedical researchers look for ways to prevent, treat, and cure diseases that cause illness and death in people and in animals.

Who conducts biomedical research?

This broad field of research includes many important areas of both the life and physical sciences and requires a team of people drawn from different backgrounds and specialties. Such a team might include medical doctors, veterinarians, computer scientists, engineers, animal care technicians, research technicians, and a variety of scientists working together to study the biological processes of a disease in order to develop an effective treatment and search for a permanent cure. They design and conduct experiments that help them understand what causes the problems and to identify ways to either treat or cure the disease. Depending on their area of expertise, researchers investigate many conditions from spinal cord injuries to cancer, from viruses to antibiotics, and from asthma to diabetes. They seek to cure medical conditions and diseases that affect our families and friends, our pets, wildlife and zoo animals, and even ourselves.

What is laboratory animal science? Why is it important to biomedical research?

Laboratory animal science is the area of biomedical research that specializes in the care and study of animals used in medical research, testing, and teaching. Animals are a critical part of biomedical research for many reasons. Before scientists can develop ways to treat health conditions in both humans and in animals, they need to understand the situation. Researchers use animals to learn more about these conditions and to discover more effective methods for diagnosing, treating, and curing diseases that affect both humans and animals and to assure the safety of new medical treatments and procedures. Scientists and medical researchers continue to look for



What kinds of careers are there in biomedical research?

Depending on your interests and the field of science you like best, there are many career options in biomedical research! Research scientists work in a research laboratory designing and conducting experiments. Computer programmers and statisticians work with computers creating programs, tallying data, and doing statistical analysis of research results. Technical writers use their good writing skills to prepare grant applications, write research plans, and summarize results. Medical doctors work with human patients. Veterinarians and animal care technicians care for research animals. Engineers design and maintain medical devices, research equipment, animal housing, and laboratory facilities. The main characteristics these careers have in common are a joy for discovery, a need to further our understanding of disease, medical conditions, and health, and the desire to help both humans and animals. There is a job in biomedical research that will suit you perfectly!



Just as careers in biomedical research cover a wide range of positions and fields, jobs can be found around the world and in a variety of work environments. There are positions in:

- Research corporations
- Biotech firms
- Colleges/universities
- Pharmaceutical companies
- Hospitals/medical schools
- Veterinary schools
- Military/government agencies
- Non-profit associations
- Voluntary health organizations

Where would I work?

Not all careers in biomedical research require a college or advanced degree. Some careers in research require certification or specialized training instead of, or in addition to, college or graduate school. The American Association for Laboratory Animal Science (AALAS) has both technician and management certification programs for those desiring to work caring for animals in the research field. For more information visit their web site at www.aalas.org.



How do I prepare for a career in biomedical research?

Start right now! For any career in biomedical research, a strong foundation in the life and physical sciences and math in high school is important. While some jobs in research require only a high school diploma, others need specific training, certification, or a college degree, and still others require education beyond the four-year college degree. It is important that you take advantage of all the classes your school offers in these areas. Whether you plan on a career right out of high school or a career that requires a college or an advanced degree, make sure you have good grades, a strong grounding in the sciences and math, and good writing and communication skills. If attending college, talk with your high school guidance counselor to make sure you take all the required classes for entrance into an accredited college or university. College is competitive and can be expensive; getting good grades will increase your chances of being accepted into the college of your choice and of receiving scholarships. Once you are in college, always work with your academic advisor to plan your course load to not only safely all graduation requirements, but to also gain exposure to the sciences relating to biomedical research. Knowing more about each field of science can better help you choose the specific area for your future career! Many in biomedical research have gone onto graduate school after college and obtained advanced degrees. If you want to pursue a career that requires graduate school or a professional degree, keep in mind there are individualized requirements for specific college courses and entrance exams for graduate, medical, or veterinary school. Work with your academic advisor to ensure you are adequately prepared!

Careers in biomedical research provide an opportunity for discovery, and each day professionals in this broad field know they are making a difference in the lives of people and animals. Their work provides hope to millions suffering from medical conditions or diseases—hope for new and better treatments, hope for a better life, hope for a cure. Through their individual contributions, biomedical researchers have the potential to improve the lives of countless people and animals all over the world. From engineers to scientists, from nutritionists to computer scientists, and from technical writers to laboratory animal technicians, these people have chosen to accept the challenge to care. You can too—by choosing a career in the exciting, demanding, and rewarding field of biomedical research.

Careers in Biomedical Research is published by the California Society for Biomedical Research (CSBR) and the AALAS Foundation. Additional copies can be requested through:

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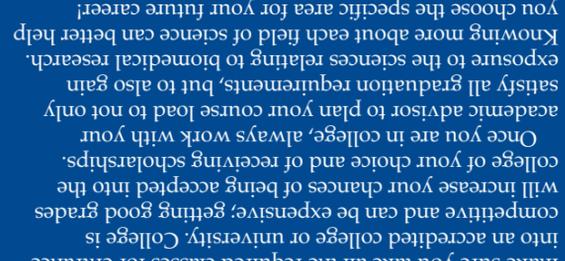
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- Biotech firms
- Colleges/universities
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- Hospitals/medical schools
- Veterinary schools
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- Non-profit associations
- Voluntary health organizations

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