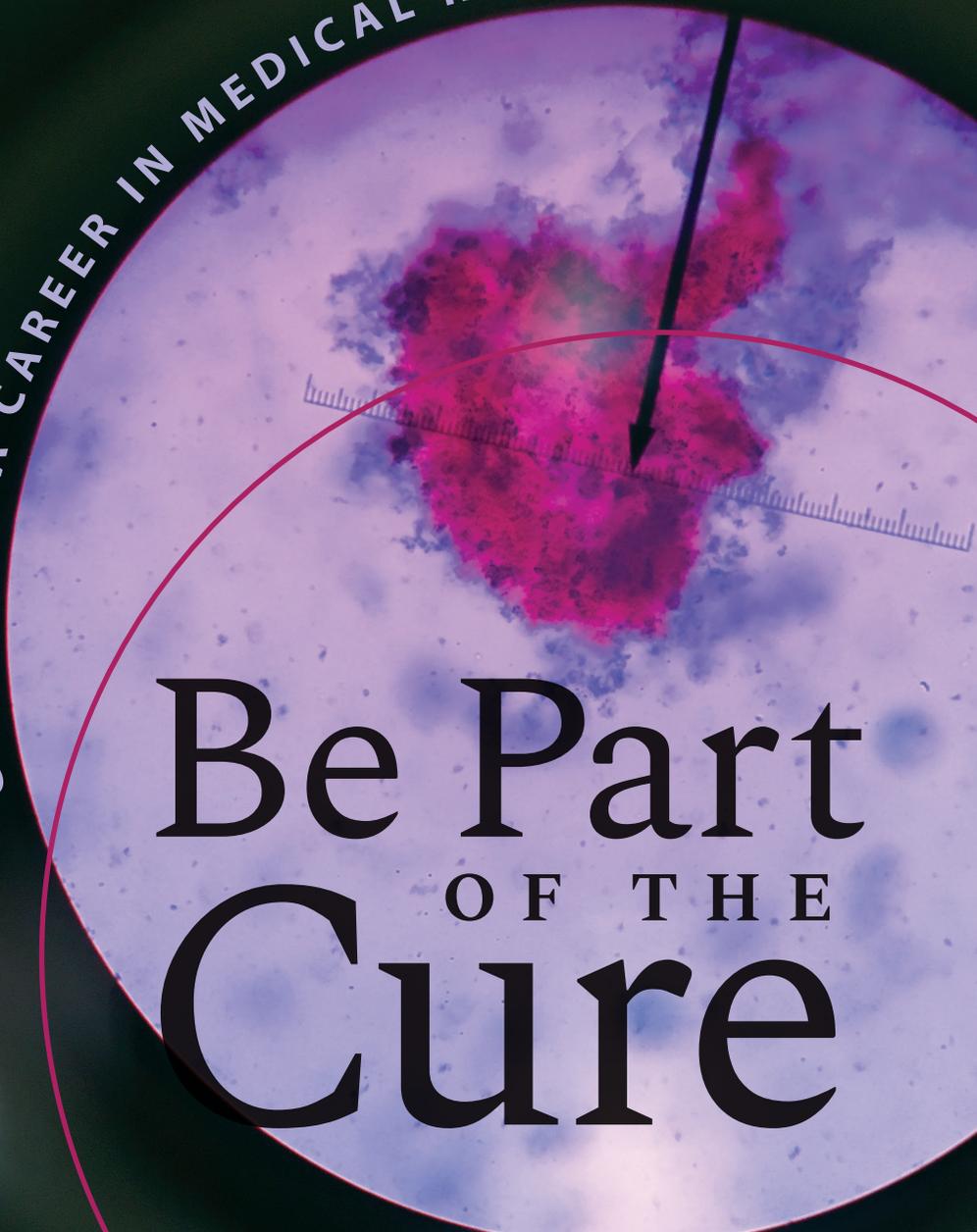


CONSIDER A CAREER IN MEDICAL RESEARCH

A circular inset showing a microscopic view of a cell stained in shades of pink and purple. A blue ruler is positioned horizontally across the cell, and a black arrow points from the top right towards the center of the cell.

Be Part OF THE Cure



Why Work in Medical Research?

Medical research spans a broad area of the sciences with a goal to gain knowledge about and understanding of the biological processes and the causes of disease, ill-health, and traumatic injury. Medical research ranges from the laboratory benchtop to the patient bedside and all the steps in between. As a cumulative process it requires the input and participation of many individuals who collaboratively look for ways to prevent, treat, and cure diseases that cause illness and death in people and in animals. It also requires careful background studies, experimentation, laboratory work, analysis, and testing. By studying the causes of disease and ill-health, this broad team can design studies that potentially address these issues, refine treatments, and eventually seek to cure medical conditions and diseases that affect our families and friends, our pets, wildlife, zoo animals, and yes, ourselves.

How is Medical Research Done?

Starting at the laboratory benchtop, medical researchers design and conduct experiments that help them understand what causes the problems and to identify the biologic mechanisms that can be acted on to prevent, treat or cure the disease. They apply their research findings and scientific knowledge to the development of practical solutions by moving forward with work with computer simulations, cell cultures and tissue samples, and typically ending with animal models, usually rats or mice. Once the new drug or techniques shows significant promise for effectiveness and safety, researchers move on to clinical trials where tests are conducted on human volunteers. Depending on their area of expertise, researchers might develop new drugs or vaccines, find new uses for existing drugs, test new medical devices (like pacemakers) or identify preventative measures for combating diseases. This work can cover a vast array of diseases including cancer, infectious diseases, Alzheimer's and other neurologic diseases, heart disease, diseases of the immune system, stroke, and thousands of other diseases and medical conditions. In addition to drugs and vaccines, research can improve surgical techniques, change treatment procedures, or identify health risks from the environment. The typical development program for a new drug, vaccine or device takes from 5 to 15 years from start to finish.



Who Conducts Medical Research?

This broad field of research includes many important jobs in both the life and physical sciences. Scientific disciplines employed in biomedical research include chemistry, biology, physiology, animal science, toxicology, pharmacology, molecular biology, immunology, pharmaceutical science and other related fields. In addition, many jobs are indirectly involved in the research process, but are critical support fields such as computer science, research administration, regulatory affairs, business development, law, facility design, and general support and oversight.

As a result, medical research requires a team of people drawn from different backgrounds, educational levels, and specialties. Such a team might include medical doctors, veterinarians, computer scientists, engineers, facility workers, animal care attendants, laboratory technicians, facility managers, lab technicians, regulatory administration, and a variety of scientists working together.

What Kinds of Careers Are There in Medical Research?

Depending on your education, your interests, and the field of science you like best, there are many career options in biomedical research! There are critical positions available with education requirements ranging from a high school diploma or a GED, to an AA Degree, to a BS, to a PhD/MD/DVM! There is something for everyone with the main characteristics that these positions all have in common is an interest in discovery, a need to understand the causes, prevention and treatment of diseases and medical conditions, and health, and the desire to help both humans and animals. The individuals in such positions provide hope to millions suffering from medical conditions or diseases, and through their individual contributions hope for new or better treatments care or cures!

High School Diploma/GED

- Laboratory Animal Technician
- Animal Facility Coordinator
- Cagewash and Sanitation
- Animal Care Attendant
- Facility Maintenance
- Clinical Trials Associate
- Preclinical Trails Associate
- Laboratory Assistant
- Administrative Assistant
- Assistant Laboratory Animal Technician

Associate Degree (2 yrs)

- Animal Facility Supervisors
- Veterinary Technician
- Medical Technologists
- Biological Technician
- Pre-clinical Trials Coordinator
- Clinical Trial Coordinator
- Research Technician
- Laboratory Supervisor
- Laboratory Animal Technologist
- Laboratory Animal Technician
- Animal Care Technician



Where Would I Work?

Just as careers in medical research are attainable with a different educational background, and 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:

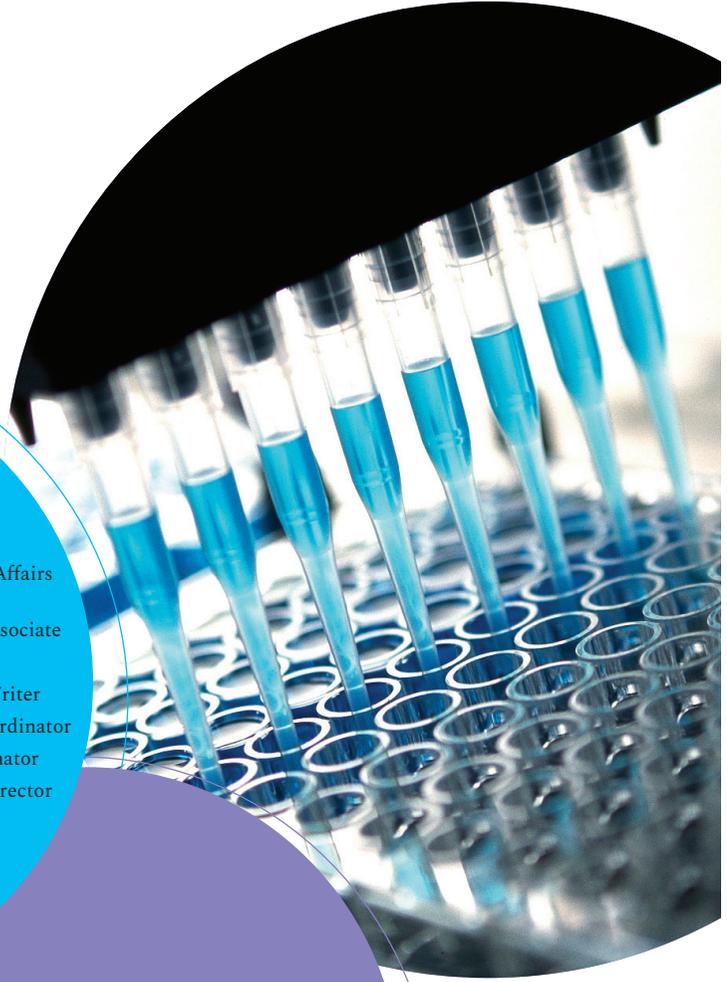
- Research Institutes
- Biotechnology Companies
- Contract Research Organizations
- Colleges/Universities
- Pharmaceutical Companies
- Hospitals/Medical Schools
- Schools of Veterinary Medicine
- Military/Government Agencies
- Non-Profit Associations
- Voluntary Health Organizations

Bachelor of Science Degree (4 yrs)

- Animal Behaviorists
- Biomedical Engineer
- Computer Scientists
- Computer Programmer
- Chemical Technician
- Nutritionist
- Pharmaceutical Technician
- Regulatory Affairs Specialist
- Research Associate
- Statistician
- Technical Writer
- IACUC Coordinator
- IRB Coordinator
- Biosafety Director

DVM/PhD/MD Degree (2-7 yrs)

- Laboratory Animal Veterinarian
- Facility Director
- Research Physician
- Researcher
- Toxicologist
- Pharmacologist
- Immunologist
- Medicinal Chemist
- Primary Investigator
- Senior Scientists
- USDA Inspector
- FDA Inspector
- Director Regulatory Affairs
- Research Administrator
- USDA Inspector





Why is Laboratory Animal Science Important to Medical Research?

Laboratory animal science is the area of research that specializes in the care and study of animals needed for medical research, testing, and teaching. Animals are a critical part of medical research for many reasons. Before scientists can develop ways to treat health conditions in both humans and in animals, they need to understand the whole-living system and how diseases interact with it. Researchers need animals to learn more about these conditions, and in turn, to discover more effective methods for diagnosing, treating, and even curing diseases in humans and in animals. Testing new drugs on humans is not allowed until safety has been demonstrated in laboratory animal species. This research that is conducted before human clinical trials can begin (called Preclinical or Nonclinical Research) is required by regulatory agencies such as the U.S. Food and Drug Administration to assure the safety and effectiveness of new medical treatments and procedures. Some animal drug trials are not for humans at all, but are designed to improve the health-care of animals. All the advances in clinical veterinary care and in veterinary medicine, such as vaccines rabies distemper, feline leukemia, and parvovirus, are the direct result of research

with animals. Research in reproductive physiology with animal models is helping to save certain species from extinction, like the African wild cat, the California condor, and the panda bear.

Laboratory Animal Science is a constantly evolving field where veterinarians, scientists, medical researchers, and animal care attendants, and veterinary technicians are constantly looking for ways to reduce the number of animals needed to obtain valid results, to refine existing experimental techniques, and to replace animals with other, alternative, research methods whenever possible. They ensure not only the care and well-being of laboratory animals, they support discoveries that benefit not only humans but animals as well. Currently, even the most sophisticated technologies cannot mimic the complicated interactions occurring among cells, tissues, and organs in a living body. Until effective alternatives are found animals will continue to play an important, and irreplaceable role. Researchers remain dedicated to providing the best care for these animals, which also strengthens valid and reliable research results. Bad animal care is bad science which is why animal care staff are such a critical part of the medical research team.



How Can I Prepare for a Career in Medical Research?

Start right now! For any career in research, a strong foundation in the life and physical sciences and math in high school is important. Focus on those STEM classes! Also refine and strengthen other critical skills such as critical thinking, writing and oral communication, active listening, and problem solving. These will all serve you well as you advance in your career in medical research.

Not all careers in medical research require a college or advanced degree! Some jobs in research require only a high school diploma, while others may require specific training or certifications. Direct hands-on research careers require education beyond the four-year college degree, like a veterinary medical degree, a degree in medicine, or a PhD in the life-sciences.

If you want to start right out of high school, apply for an entry level position at a research facility. If you plan on 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. Colleges/universities are 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 satisfy all graduation requirements, but to also gain exposure to the sciences relating to medical research. Knowing more about each field of science can better help you choose the specific area for your future career!

When it comes time to enter the work force, employers typically put more emphasis on relevant work experience than on education, so it's important to try to find internships or other summer work opportunities before graduation. Working in a professor's lab is often the way many successful scientists started their careers.

How Can I Find Out More?

Knowing more about medical research can help you choose the specific area of your future career! Visit ca-biomed.org/get-the-facts/ to *Get the Facts about Medical Research*. Conduct your own research on the web! Some key words that will help your search are: life science careers, biomedical research careers, medicine research careers, laboratory animal science, preclinical research jobs, drug development careers, biomedical engineering, and biotechnology. The American Association for Laboratory Animal Medicine also has information about careers in research www.aalas.org/certification as does the site Kids4Research kids4research.org/.



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Biomedical
Research
Association**

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ca-biomed.org
(916) 558-1515
info@ca.biomed.org