

2019 PSBR 7th & 8th Grade Essay Contest
Third Place

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Every day 151,600 people and 150 million animals die. Without biomedical research, this number of daily deaths would increase. Utilization of animals in biomedical research has allowed many medical advancements. Biomedical research is an area of science that is devoted to preventing and treating diseases. This type of research uses many techniques to develop treatments and cures (SUBR).

All biomedical research starts with basic research. This research advances fundamental knowledge about living organisms and their functions (PSBR). Next comes the applied research; this is designed to solve a specific problem. Solutions to the problem could be a new drug or surgical procedure (SJSU). Following the research, scientists move onto pre-clinical and clinical trials. A pre-clinical trial is when a new idea is medically tested. It uses animal models, which are non-human species, for studying a new cure or treatment. The type of animal is chosen based on specific traits that make it respond the same as a human. Once the treatment passes certain standards it moves onto a clinical trial. During a clinical trial, the new treatment is tested on humans. Eventually, it is decided if the treatment will move onto the market or become an official medical treatment (PSBR).

Many people are concerned about the welfare of animals that are used for research. 95% of animals used in biomedical research are mice, rats, and other rodents. These animals were bred specifically for research. Some other animals are used, though these animals make up less than 1% (PSBR). All animals used in research are well cared for and some, specifically dogs, can exercise (UFAW). There are regulations and associations that exist to protect animals used in testing. The 3Rs are principles that are followed to help animal welfare. Refinement, refines treatments on animals that could cause them harm. Reduction states scientists should try to reduce the number of animals used. Replacement, suggests replacing animal testing with other testing options (UFAW). Replacement of animal testing can be done in many ways. Simulations and computer modeling is the use of computers to simulate and study the complex systems of the human body. Scientists can change variables in a system that they study and see how it would affect the body (NIH). Researchers also replace animal testing with in vitro research, which is testing treatments on artificial cells in labs (PSBR). Finally, researchers use epidemiologic studies. Epidemiology is the study of how often a disease occurs in different groups of people and why (BMJ).

Scientists are reducing the need for animals in clinical testing with new technologies and advancements. This brings up the ethical question, should animals be used in research at all? Though many people think it's unethical to test on animals, sometimes it's necessary. The use of animals in research has created many successes in disease prevention and treatments. Some

medical advancements for humans include: vaccines, cancer treatments, heart and vascular surgery, and more. Without animals in biomedical research, scientists wouldn't have discovered all these treatments. The testing and research on animals helps humans AND animals. It gives animals vaccines against diseases, cancer treatments, prosthetic legs for feline and canines, and antibiotics (PSBR).

Without animals in biomedical research we would not have the advancements we do today. It is important for society to know about biomedical research. People misunderstand the use of animals in research and do not support it. The future of biomedical research, research that saves so many lives, will not thrive without funding. That is why it is crucial for people to understand animals' roles in research. If society loses biomedical research, it will lose countless lives.

Work Cited

"SUBR." *States United for Biomedical Research*, statesforbiomed.org/education/background-on-biomedical-research/what-is-biomedical-research/.

Profil Institut für Stoffwechselforschung GmbH. "The Phases of Preclinical and Clinical Trials." *The Phases of Preclinical and Clinical Trials*, www.profil.com/knowledge-center/trial-stages.

"Welfare of Animals Used in Scientific Testing and Research." *UFAW*, www.ufaw.org.uk/why-ufaws-work-is-important/welfare-of-animals-used-in-scientific-testing-and-research.

"Computational Modeling." *National Institute of Biomedical Imaging and Bioengineering*, U.S. Department of Health and Human Services, www.nibib.nih.gov/science-education/science-topics/computational-modeling.

"Chapter 1. What Is Epidemiology?" *The BMJ*, www.bmj.com/about-bmj/resources-readers/publications/epidemiology-uninitiated/1-what-epidemiology.

Levitt, Michael, and Jonathan M. Levitt. "Future of Fundamental Discovery in US Biomedical Research." *PNAS*, National Academy of Sciences, 20 June 2017, www.pnas.org/content/114/25/6498.

Research Methods, www.psbr.org/animal-research-2/research-methods.