



**2014 PSBR High School Essay Contest**  
***Finalist***

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Biomedical research can be described as the study of life and the treatment and prevention of the diseases that come with it. Animals are used in this research because they provide an in-depth understanding of the human physiology. Through various methods, animals are used to better the lives of millions of people as well as other animals.

Biomedical research is far from cut and dry, instead it is multifaceted. There is, of course, the most basic research in which the processes of life are studied and applied to much more concentrated ideas. These ideas result in applied research, which is performed for a specific goal. For example, a study aimed at finding the cure for muscular dystrophy is classified under applied research. This research is split into three groups: In vitro, ex vivo, and in vivo. In vitro is performed in a laboratory setting using bacteria or tissue samples. Ex vivo and in vivo both refer to a living creature. However, an ex vivo study only uses samples from a living organism while in vivo uses the entire organism. These three methods are performed while always keeping prior knowledge gained from basic research in mind. The information gained by these three versions of research can be translated into new ways of diagnosing and treating disease. They can also lead to clinical trials that involve human volunteers instead of animals. This entire scientific process is made complete with animal testing.

Every person in the U.S. can safely say they have been directly affected by animal testing. This is because most drugs, vaccines, medical treatments, and surgical procedures have depended on these studies. Because of our similar anatomies, researchers can make comparisons that help to better understand how the human body functions. This allows scientists to create hypotheses on how a disease can be treated or a procedure be done. For example, the ophthalmologic surgery for removing cataracts was developed through trials with animals. Because of this, 1.5 million Americans will be able to safely prevent the loss of their vision. The drugs we are now able to take for granted are only in existence because of these means. For instance, the polio virus has been virtually wiped out in North America because of a vaccine developed on rodents and primates.

One thing that most people do not think of is that most human diseases exist in at least one species of animal. To put this into perspective, approximately 90% of veterinary medicine is essentially the same as human medicine developed in animal trials. Looking at it this way, animal research seems even more important. Animal longevity has significantly improved since animal studies have begun to aid veterinary medicine. For instance, farmers use treatments developed in animal testing labs to help reduce disease in their herd animals. Besides benefitting animals medically, animal research has also provided the means for many breeding programs used with endangered species.

Opponents argue that the use of animals in biomedical research is unethical because there are alternatives. These alternatives include cell cultures, computer models, and tissue samples. However, they prove to be subpar when compared to live animal testing. Not even the most

innovative technology can accurately replicate the complex cellular processes that occur in living organisms, at least for the time being. In the words of Wise Young, the director of neurosurgery at New York University, "I hope someday there will be no need for animal research, but right now there is." In addition, all animal testing must follow "The 3R's." These "R's" include reduction, refinement, and replacement. In short, they explain that the minimum amount of animal subjects must be used to obtain the same, or more, amount of data. Then, the well-being of the animals should always be considered. Finally, whenever they can, researchers must replace live animals with non-animal forms of analysis.

In conclusion, animals are used in biomedical research to ensure the safety of both humans and animals alike. The benefits of animal testing are vast and reach almost every single citizen in America. We owe much of our knowledge about biomedicine to test animals. Besides human benefits, the veterinary field has gained much from the research as well. Opponents believe in the use of alternative research methods over live animal testing, however they are not as effective. Animal testing for biomedical research has been a key factor in the development of new medical discoveries and has provided a priceless amount of scientific understanding.

#### Works Cited

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