

2020 PSBR 7th & 8th Grade Essay Contest
Third Place

Sophia R.
St. Ignatius of Antioch
Yardley, PA

“Only through understanding how living systems function normally as well as learning how and why normal processes fail and result in disease can scientists find answers to improve human and animal health” (“Biomedical Research”). Biomedical research involves the investigation of the biological process and looks at the causes of various diseases and attempts to circumvent them through observation, lab work, analysis, and testing (*What Is Biomedical Research?*).

The Biomedical Process includes the scientific method, basic research, applied research, in vitro research, ex vivo research, in vivo research, and preclinical trials. Basic research is the understanding of how the process in living organisms function and develop. Applied research is research towards specific discoveries, for example the development of new medication, medical devices, or surgical procedures. Ex vivo means “out of living.” Experiments can be done on living cells or tissues taken from an organism and cultured laboratory apparatus outside the organism. The living cells serve as models of the whole organism. Finally, clinical research determines the safety and effectiveness of medications, devices, diagnostic products, and treatment regimens designed for human use. These examples can be used for prevention, treatment, diagnosis, or for relieving symptoms of a disease (CBRA).

Animals are an important part of biomedical research and are used to help scientists understand humans. They are used because they have a shorter life cycle than humans, are easier to study, and develop similar diseases to humans, such as Type I diabetes, hypertension, allergies, and cancer (Barré-Sinoussi and Montagutelli). Also, they have similar body parts to humans, for example, pig skin. It is also easier to control the environment in order to conduct the experiment. Some of the animals most often used are mice, rats, and fish. Because of the Animal Welfare Act of 1966, minimum standards of care have been established for animals used for research. It called for stronger standards and more facility checks. Therefore, while many feel it is wrong to experiment on animals, the government has made efforts to ensure that it is done in a safe, effective, and humane manner.

In addition to animal experimentation, there are alternative methods being sought. For instance, simulations and computer models are used, where scientists are able to use computers to depict an experiment. In vitro (meaning “in glass”) tests are also used, where cell cultures are taken and grown in a laboratory. Human clinical trials are not without controversy, and take place in a hospital or a clinical setting, and involve informed human volunteers to gauge the safety and effectiveness of drugs, procedures, or medical devices (“What Is Biomedical Research”). Finally, epidemiological studies look at diseases within specific populations.

Many question the ethics of animal research, and even more question the ethics of human experimentation. Unfortunately, human experimentation often exploits those who are underprivileged (“Human Experimentation: An Introduction to the Ethical Issues”). Therefore, using animals seems safer and more ethical. In fact, “Virtually every major medical advance of the last century has depended upon research with animals. Animals have served as surrogates in the investigation of human diseases and have yielded valuable data in the process of discovering new ways to treat, cure, or prevent them. From immunizations to cancer therapy, our ability to manage the health of humans has also improved because of animal research and the application of medical breakthroughs in veterinary medicine” (“Biomedical Research”). It seems that biomedical research is here to stay, and with a blossoming human population and ever-changing medical needs, the need for this type of research will continue to grow as scientists search for new cures for diseases such as the coronavirus.

Works Cited

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