

2013 PSBR 7th & 8th Grade Essay Contest
Second Place

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What's the Point of Bioscience Research?

Bioscience research: the area of science that has saved millions of lives. Helping to improve life today, scientists in this field discover ways to prevent illnesses, while developing products and medications to treat sicknesses of all kinds. Without the teamwork of individuals with varying backgrounds and skills, the goals of these experiments would be unreachable. So what is bioscience research, and how does it help us today?

Biomedical research begins with the scientific method: observation, hypothesis, and conclusion. It is broken up into different forms of investigation, beginning with basic research. Carried out to increase scientific knowledge, basic research provides the building blocks for other types of research. Scientists then use applied research, which involves using existing knowledge and then stretching this information to address a specific problem. The testing continues with in vitro, ex vivo, and in vivo, which are experimentations done on living bacteria, cells, or tissues. Scientists collect these samples and then perform cultures, watching their growth and gaining more information. In pre-clinical trials, non-human models are tested in the early stages of medication. This assists researchers in expanding their knowledge and in discovering more effective methods for diagnosing, treating, and curing diseases that affect both humans and animals. After that, human volunteers are used for testing, to determine the safety and effectiveness of medications.

Without the help of animal models, scientists would not be able to develop their research. Bred specifically for lab research, rats, mice, or other rodents are used during the process of pre-clinical trials. Essential to the development of effective methods for diagnosing and treating diseases that affect both humans and animals, they also assure safety of new medical treatments. The use of animal models is necessary because it is impractical, illegal, and unethical to use humans in the early phase of research. Because animals are biologically similar to humans, along with being susceptible to many of the same health problems, they can assist in the development of new treatments for humans.

An illness that has affected millions of people, including my own grandparents, is Alzheimer's disease. Older people are typically victims of Alzheimer's, undergoing memory loss and problems with thinking and behavior. Being a progressive disease, symptoms gradually worsen over a number of years, until the affected person is unable to recognize anyone they have previously known. Alzheimer's has no current cure, but a number of treatments are available. These medications, including a class of drugs called cholinesterase inhibitors, help to stop memory loss and confusion for a limited time. With bioscience research, there is hope that a cure for Alzheimer's may be on the horizon.

Without bioscience research, humans today would live with the risk of contracting many harmful and even fatal illnesses. Our world would be much different- we wouldn't have as much

information about diseases and treatments, and many people would not be as healthy. Overall, the science of biomedical research is extremely important for the world today.