

2016 PSBR 7th & 8th Grade Essay Contest
Second Place

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The year was 1985. John DiMuzio was animatedly talking to his friend over the telephone when he paused. He felt...odd. He said a hurried goodbye, knowing something was wrong. When his wife arrived home, she found him sprawled on the floor, his eyes blank. Like countless others, John suffered a fatal heart attack. However, heart attacks need not be fatal any longer. Biomedical research has made great strides with heart disease and many other conditions, preventing fates similar to John's with aid from new medical procedures. To develop these advancements, research must be conducted.

Basic research is the simplest type of research. It aims to answer a question after an observation is made, rather than treat a specific condition. Applied research uses information from basic research to cure a specific disease or condition with drugs and procedures. Computer, animal, and human models are utilized in applied research. Finally, in clinical research, data from basic and applied research are used to test a procedure on human subjects.

Researchers test remedies following a specific cycle, the biomedical research process. This includes computer modeling, in vitro testing, animal research, human clinical trials, and epidemiological studies.

When researchers define a problem and propose a potential therapy, they test the solution first in computer models that simulate human or animal responses. Without putting a life at risk, researchers simulate effects of their proposal. Scientists can also analyze results from previous experiments to obtain more accurate results.

Research proceeds with in vitro testing. In vitro, Latin for "in glass," refers to placing human, plant, or animal cells in glass. Researchers test effects of a compound with these cells.

Researchers then move to animal models. 95% of animals used in research are rodents. Monkeys, fish, guinea pigs, and dogs are also used. Researchers observe how animal models are affected by treatments. Researchers can simulate a human condition with an animal model; consequently, some animals have been genetically altered. Humans and animals share a large percentage of genes.

Researchers respect that animals are living creatures. They place much importance on the three "R"s of animal testing: reducing the number of animals tested; replacing animal testing with other models like in vitro testing and computer models; and refining procedures to benefit both the animal and the research.

Human clinical trials follow animal research. Researchers see the true effects of their research on a human. Subjects are tested voluntarily and know the associated risks. The effects of certain medications, diets, and surgical procedures are observed. Epidemiologists study health patterns of groups of people. They also test humans to learn how illnesses are spread and controlled while studying statistics to find the causes of illnesses and who is at risk.

Biomedical research improves lives and has done much to help those with heart disease, AIDS, and cancer. However, improvements are needed. In the future, cancer may be the next polio, where biomedical research and testing provide a cure. Biomedical research saves lives.

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