

2017 PSBR High School Essay Contest
Finalist

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Four years ago, I had noticed a sudden change in pace in my 55 year old father. He'd begun to eat less and sleep more. Instead of playing ping-pong with me or running at the park, he'd rather lie down on the couch. This trend seemed confusing at first, but when I came home on a normal school day to find my father already rushed to the ER due to chest pains, fatigue, and lightheadedness, the situation had become clear. His surgeons worked meticulously to guide the wire mesh stent into position, so that he can live another day. Months after the scare, he lives an active lifestyle but remains dependent on medications. Luckily, we live in a society that is well prepared to handle all kinds of diseases. As a researcher, my father knew of the discoveries in medicine that have been made due to the insurmountable help from animals, yet he never appreciated all they've done until after they had saved his life.

In general, animal research utilizes a two-step process: determining how a disease works and finding how safe the treatment will be. Animals are an invaluable research tool, for by the process of evolution and common ancestors, they have body parts and interacting biological systems similar to that of humans. Animals provide benefits over using humans for testing – they have simpler life cycles and are easy to observe. Reproducing more is a simple task and controlling their surroundings to get the most precise data possible requires little effort.

However, the fierce debate on the ethics of using animals for biomedical research is still being brought up time and time again. Animals-rights activists insist that these animals not be used, for their rights are being infringed upon by the scientists, surgeons, and veterinarians who strive to know them better. While the Animal Welfare Act passed in 1966 has been criticized over the decades for not stopping the use of animals and merely protecting how they are treated, using animals to find treatments and vaccines cannot be replaced. These animals have been well-provided for in a sound environment, and when tested, they are given specialized painkillers to eliminate the potential discomfort. It's undeniable that biomedical engineering has saved lives and improved the quality of those lives as much as the world's physicians have and will continue doing so with the help of animals.

Interestingly, America's most popular household pets help find cures. Dogs, typically beagles, are used in cardiovascular studies, pulmonary studies, cancer research, and orthopedics, just to name a few. Cats have been utilized to gather more information on the cardiovascular system, immune system, and nervous system. Zebrafish and mice are similar to human hearts and are used to find how to reuse stem cells to replace dead cardiac muscle. Zebrafish have a unique characteristic in which they can grow and repair their own cardiac muscles. Delving deeper into the semi-transparent and easily observable body of the zebrafish, scientists work towards finding what factors allow them to pull off such a feat.

The death sentence twenty years ago in the form of cardiovascular disease was an epidemic that coincided with the childhood obesity epidemic. It went through the US and beyond

and is being nullified with every new discovery. Newly found heart operations and medicine have saved the lives of well over a million lives just in the US. 1967 marked the first wave of heart transplants, starting in Cape Town, South Africa by a brilliant man by the name of Lewis Washkansky. Half a century later, his work is still being admired for being a pioneer into heart operations, and in 1986, a duo by the name of Puel and Sigwart successfully created the protocol for placing stents to re-allow blood flow into arteries, a procedure coined as coronary scaffolding. Their research had come a long way and through waves of animal research with dogs, their protocol was ready to be released.

On his way to work to the lab my father often thinks about his life now - one that is hampered by the loss of one-third of his cardiac muscle. All the while, he appreciates the gift of a second chance that animals have given to him. With his new and improved lifestyle, he goes to work tackling the case of high blood pressure so that he in return, can help those that helped him.

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