

Until I turned 15 I didn't really know what Alzheimer's disease was. I knew from my mother that it ran in her side of the family, and that both her mother and grandmother had it. But to me it was still just a regular disease, the only difference being that it affected the brain. I didn't realize what it did to people, how it took away the part of a person that made them who they were. When I was a child growing up in Toronto, I was constantly over at my grandparents house. I remember taking piggy-back rides with Grandpa Murray and frying up fish with Grandma Pam. Then when I was 7, we moved to Arizona. My time with my grandparents grew smaller as I grew bigger, with schoolwork and activities eating up more and more of my time and a small family spat ruining any other chance of seeing them. And two years passed like this, until one day 4 months ago my mom got a call. Grandma Pam was in the hospital and she needed to go to her. So my mom went. She visited Grandma Pam for a few days and when she came back, she suggested that we set up a video call so I could talk to her. I thought it was a great idea. It took me about 5 minutes to realize that Grandma Pam had no idea who I was. This woman, who I had spent so many years of my childhood with, couldn't even recognize me. I lasted 5 more minutes on the call. After the call, I spent some time researching Alzheimer's and found out some of the incredible things scientists were doing with animal-based experimentation. I can't say that animal-based medical research is going to save my grandma's life, but even if it can't, maybe it will help someone else's.

Alzheimer's is one of the most common and most debilitating diseases in America today. Over 5 million people in America today have the condition, and that number is set to grow massively unless a cure is found. As Alzheimer's targets mostly older people, with one in ten over 65 having it and half of all those over 85, the disease grows increasingly relevant as a result of the US's aging population. Because of medical advances, people are living increasingly longer lives, leading to projections by the Alzheimer's Association that by 2025, the number of people with Alzheimer's disease increasing by at least 14% in every state, 700,000 people, with

Arizona's number of affected citizens projected to increase by a breath-taking 53%

For the disease itself, Alzheimer's is one of the most common neurological conditions, making up from 60-80% of all dementia cases. It is characterized by memory loss, language problems, and erratic behavior eventually leading to loss of motor function. The physical signs of the disease are amyloid plaques and neurofibrillary tangles (tau) on the brain. Another effect of the disease is the loss of neuron connections in the brain, particularly in the hippocampus, which controls memory.

So far, animal research has been essential in identifying causes and testing treatments for Alzheimer's. Animals with the most similar brains to those of humans, particularly monkeys and mice, have been critical in finding molecules that seem to play a role in disease development, such as the link between miR-34c and neurodegenerative diseases discovered in a study by *Frontiers in Molecular Neuroscience*. Methods of early detection that show promise like radiopharmaceuticals for the many who are diagnosed too late have also been tested using animals. Radiopharmaceuticals emit radiation in the presence of the amyloids that signal Alzheimer's. Brain scans can then detect the radiation and confirm or deny if someone has gotten the disease. Animal research has also linked Alzheimer's with insulin resistance in brain cells, opening up many new possible avenues for a cure. Another link that has been found due to animal research is between head trauma and faster development of the disease. Scientists are only scratching the surface of the causes and cures of Alzheimer's, but it is undeniable that animal research will continue to be invaluable. Who knows what the future holds for my grandma, but due to animal research there is a glimmer of hope.

## Works Cited

- "Benefits." *Alzheimer's Disease / Understanding Animal Research*. Understanding Animal Research, 2017. Web. 6 Mar. 2017.
- Bhatnagar, Shephali, Howard Chertkow, Hyman M. Schipper, Vikranth Shetty, Zongfei Yuan, Timothy Jones, Samantha Jenkins, and Eugenia Wang. "Increased MicroRNA-34c Abundance in Alzheimer's Disease Circulating Blood Plasma." *Frontiers in Molecular Neuroscience*. Frontiers in Molecular Neuroscience, 12 Jan. 2014. Web. 5 Mar. 2017.
- Milnes., and Alzheimer's Association. 2016 Alzheimer's Disease Facts. "Alzheimer's Disease Facts and Figures." *2016 ALZHEIMER'S DISEASE FACTS AND FIGURES* (2016): n. pag. Alzheimer's Association, 2016. Web. 7 Mar. 2017.