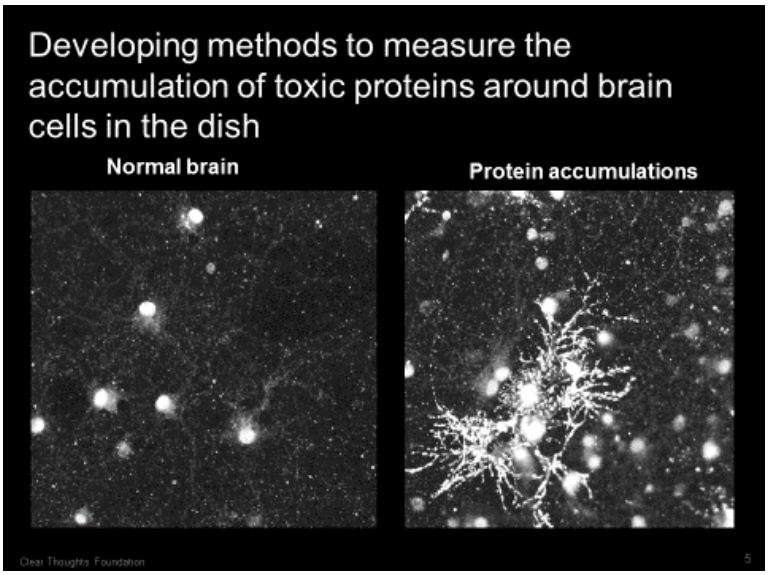
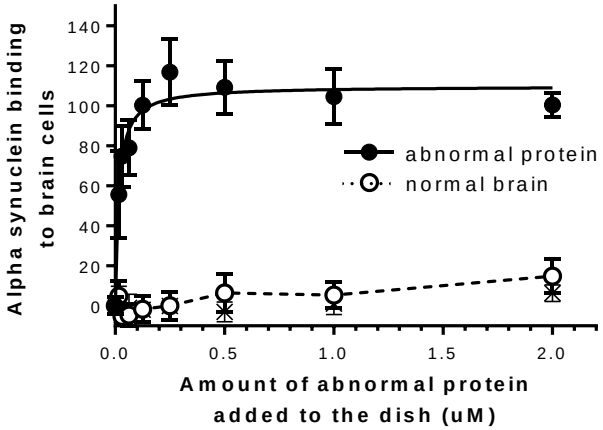
Abnormal proteins accumulate around brain cells of patients with dementia and interfere with normal brain function. Currently, no drugs are available that can stop these abnormal proteins from interfering with normal brain cell function and stop the progression of these diseases. The Donald M. Jameson Jr. Fellowship provides a scientist, like myself, with financial support for one year to research and find ways to discover drugs that can stop dementia.

Since receiving the Fellowship, I have developed a new and highly accurate method to measure the accumulation of these abnormal proteins around brain cells in the petri dish, where the brain cells are grown. This method uses a robot that takes hundreds of pictures of brains cells in a dish through a microscope, and then uses image processing to automatically measure the amount of abnormal protein that accumulates on the brain cells.

Some examples are shown below; the image on the right shows a picture of healthy brain cells growing in the dish. In the image on the left abnormal protein has been added to the brain cells and completely covers some of them and all their branches. Next to the image, the graph shows the quantification of abnormal protein around brain cells. We can see a dramatic increase in binding of the abnormal protein to brain cells, compared to vehicle treated cells. In this example the abnormal protein that was added is called alpha synuclein, which accumulates in the brains of people with dementia associated with Parkinson's disease and Dementia with Lewy Bodies. This method can also be used to measure other abnormal proteins associated with a variety of dementias. This method has never been demonstrated before in history, and was only made possible because of the support of the Clear Thoughts Foundation.

This is exciting, because this means that now we can use this method to search for drugs that stop the accumulation of these abnormal protein. Before we begin this search, we have to make sure that this method is robust and reliable enough to work the same way across the days and weeks that it will take to search for such drugs. That is the work that I am engaged in currently. By the end of my Fellowship period, I will publish a paper demonstrating this method in a scientific journal. I look forward to sharing this method with the scientific community.





Personal Statement

I joined Clear Thoughts Foundation in October of 2014. I am honored to be part of Clear Thoughts Foundation and their mission to accelerate the discovery of drugs to stop dementia. I believe that Clear Thoughts Foundation provides a very unique opportunity for scientists, such as myself here in the Pittsburgh region to gain training in an industry environment and become instrumental in finding ways to discover new drugs that can stop dementia.

I would like to extend my sincere thanks to all the generous donations to Clear Thoughts Foundation for creating this great opportunity. I would also like to thank the founders and volunteers for their tireless work.