



**CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY**

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Project Title Effects of the Omega-3 Fatty Acid Resolvin-D1 in a C. elegans Parkinson's Disease Model	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this project is to see if the inducing of Resolvin-D1 will prevent C. elegans from developing Parkinson's Disease after they are induced with Manganese Chloride which causes PD.</p> <p>Methods/Materials C. elegans, maintained in nematode growth media, were used for 3 assays. The thrashing assay compared the locomotion of worms with MnCl₂ and worms with both MnCl₂ and Resolvin D1 along with a control set. This was observed by placing the sets in M9 buffer and observing movement. The visualization assay was used to compare the deterioration/shape of dopaminergic neurons of worms in Resolvin/MnCl₂ and worms in just MnCl₂. The TBARS assays was used to compare malondialdehyde levels of Resolvin worms and MnCl₂ worms by centrifuging worms and placing in a spectrophotometer, allowing to calculate oxidative stress levels which reveal PD.</p> <p>Results The thrashing assay showed that Resolvin preserved the locomotion of the worms because they moved at the same rate as the control and twice as fast as the Manganese worms. The visualization assay showed that Resolvin preserved the dopaminergic neurons of the worms when it was compared to the deterioration of neurons in the MnCl₂ (induce PD) worms. The TBARS assay showed Resolvin lowered oxidative stress levels of worms compared to the MnCl₂ and was the same as the control, showing that Resolvin essentially reversed PD because of low stress levels.</p> <p>Conclusions/Discussion It was concluded through the three assays that adding Resolvin D1 reversed PD in the worms. Their locomotion and dopaminergic neurons were preserved and they had lower oxidative stress levels, showing that they did not have PD, while the MnCl₂ worms did. This holds great promise for Resolvin having a therapeutic effect in the curing of PD, which is induced by high oxidative stress levels. The preserving of movement and retention of neuronal shape proves that Resolvin stopped the worms from developing PD, and lowered oxidative stress levels were a final indicator of this.</p>	
Summary Statement This project is about researching if inducing Resolvin-D1 in C. elegans reverses the effects of Parkinson's in the worms and thus potentially cures it.	
Help Received Used lab equipment at Schmahl Science under the supervision of Dr. Anuran Chatterjee	