

Using a zebrafish PCR array to study the transcriptome response of genes mitigating reactive oxygen species in zebrafish (*Danio rerio*) larvae during dietary lipid absorption. Tom Schmieta, Jeffery Johnson, Elizabeth Walters, Heather Price, and James W. Walters, Ph.D.*, *Dept. of Applied Science and Mathematics, Bluefield State College, Bluefield, WV 24701.

Cardiovascular disease is one of the main risk factors of death worldwide. A diet rich in saturated fatty acids and cholesterol is known to cause cardiovascular diseases like coronary heart disease and atherosclerosis by increasing reactive oxygen species levels and causing mitochondrial dysfunction. Unsaturated fatty acids have shown to decrease risk for cardiovascular disease by reducing cholesterol levels. To determine the relationship of oleic acid and cholesterol to reactive oxygen species (ROS), zebrafish (*Danio rerio*) were fed high fat diets consisting of oleic acid (OA) and oleic acid with cholesterol (OAC). We hypothesize that zebrafish larvae that are fed with oleic acid will show gene upregulation in genes that mitigate oxygen reactive species in comparison to a diet consisting of oleic acid with cholesterol. By performing real-time PCR, the gene expression under each condition was compared and analyzed to each other and a control group. The results show that the genes of main interest *sod1* and *sod2* did not show an upregulated expression in either experimental condition. However, other genes like *gpx4a* and *gstp1*, which are players in the glutathione antioxidant pathway, have shown an upregulation (7.2-fold and 2.5-fold) in the OAC condition compared to the OA condition. Previous research in this lab has shown a relationship between glutathione and oxidative stress. These data support the suggestion that a diet rich in cholesterol increases gene expression of ROS mitigating genes related to glutathione.

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