ECOTOXICOGENOMICS of DAPNIA MAGNA

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ABSTRACT

Analyzing differentially expressed genes (DEG) in aquatic organisms is a useful technique to finding biomarkers of exposure. It can provide a more comprehensive and diagnostic approach to monitor emergent contaminants in the environment.

When the organisms are exposed to certain toxicants, their gene expression profile yields a set of differentially expressed genes for each compound. In this research, we exposed the water “flea” known as Daphnia magna to high priority pollutants and identified the DEG for each toxicant using microarray technology. Results show that the group of D. magna exposed to cadmium sulfate exhibits a unique set of DEG. In the future, the DEG profile can be used to deduce cadmium’s toxic mode of action or for exposure assessment. Studying the DEG of D. magna has led us to understand how these compounds effect aquatic organisms and ecosystems and may someday provide a detailed understanding of how these chemicals affect the biological activities of organisms in constant exposure to emergent contaminants.

RESULTS

From the acute 48-hr acute toxicity bioassay, we found the LC 50 used for moderately hard water. The LC 50 value was 0.02 mg/L which is 180 μg/L. We found that at this low level concentration, the D. magna exposed to Cd, respectively. The majority of the dots that reside along the line show that those genes are being expressed in both the control and exposed group. Based on our research, we discovered that D. magna exposed to Cd, respectively. The majority of the dots that reside along the line show that those genes are being expressed in both the control and exposed group. Based on our research, we discovered that D. magna exposed to Cd, respectively. The majority of the dots that reside along the line show that those genes are being expressed in both the control and exposed group. Based on our research, we discovered that D. magna exposed to Cd, respectively. The majority of the dots that reside along the line show that those genes are being expressed in both the control and exposed group. Based on our research, we discovered that D. magna exposed to Cd, respectively. The majority of the dots that reside along the line show that those genes are being expressed in both the control and exposed group.