

Scott Nichols, Chemistry

Year in School: Senior

Hometown: Ballwin, MO

Faculty Mentor: Dr. Kathleen Newton, Biological Sciences

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Altered nuclear gene expression in response to mitochondrial mutations in maize

Scott Nichols, Louis Meyer, & Kathleen Newton

Maize non-chromosomal stripe (NCS) plants are defective plants with mutations within mitochondrial DNA (mtDNA) resulting in deficiencies in the electron transfer chain (ETC). It has been shown the cells will synthesize nuclear proteins in response to the mitochondrial mutations. All NCS mutants are known to up-regulate several stress proteins in response to defective mitochondria, including alternative oxidases and heat shock proteins. Changes in RNA levels can indicate which proteins differ in expression. The NCS2 has a mutation within complex I of the ETC. Using microarrays, total RNA samples of the NCS2 mutant are being compared to those of relatives with normal mitochondria. So far, many differences in RNA levels have been observed. Data is still being collected and being analyzed to determine how many of the apparent differences are statistically significant.