

# 2008 Ohio Student Research Forum

The Ohio State University

August 7 - 8, 2008

## RESEARCH ABSTRACT FORM

**TITLE:** The Potential Effect of UV-Radiation on the Melanocytes of Human Skin

**AUTHOR:** Rosalyn Gholston

**MENTOR(S):** M.L. (Nikki) Harter, Jingfeng Sha

**INSTITUTION:** Case Western Reserve University

Malignant Melanoma is responsible for more than 75 percent of skin cancer deaths and the most common form of cancer for adults between 15-29 years of age. Recent studies have shown a possible correlation between the unregulated growths of melanocytes, melanin-producing cells of the skin that may lead to the onset of melanoma upon intermittent exposures of ultraviolet radiation, and the epigenetic modification of components, responsible for the instruction of gene expression. At high levels, MicroRNAs, single-stranded RNA molecules, has been linked to the development of several types of cancer within mouse embryonic stem cells. The ability to successfully isolate integral RNA from melanocytes of human skin is core in the attainment of an in-depth understanding of epigenetic effects in the development of melanoma. Laser Capture Microdissection (LCM) was utilized to carefully isolate the melanocytes from the rugged stratum basale, while limiting potential contamination caused by the extraction of neighboring keratinocytes that are of minimal or no experimental significance. RNA degradation was prevented through the use of RNAase-free materials, as well as the minimization of procedural time subsequent to the isolation of 6-mm human skin punch biopsy. The quality of RNA was assessed via qRT-PCR as well as gel electrophoresis of GADPH (Housekeeper gene) and RNU48, which served as standard control genes. According to data analysis, 95 percent of the template RNA was successfully detected upon each cycle completion of qRT-PCR. The relatively low Ct (threshold cycle) values produced suggests the presence of abundant RNA at the start of reaction, thus an indication of a highly reproducible assay. MicroRNAs GADPH and RNU48 were successfully amplified via gel electrophoresis. The LCM samples produced high quantities of integral microRNA, with little or no degradation upon immunohistochemical staining and microdissection. Experimental findings indicates that it is possible to retain a plentiful supply of integral RNA, therefore enabling the future characterization of gene expression patterns within melanocytes, genome-wide profiling of DNA methylation, as well as other correlational analysis between epigenetics and the onset of malignant melanoma.