

# West Chester University of Pennsylvania

## Annual Progress Report: 2009 Formula Grant

### Reporting Period

January 1, 2010 – June 30, 2010

### Formula Grant Overview

The West Chester University of Pennsylvania received \$4,080 in formula funds for the grant award period January 1, 2010 through December 31, 2010. Accomplishments for the reporting period are described below.

### Research Project 1: Project Title and Purpose

*DNA Polymerase Expression of Human Colon Cell Lines following Chemotherapeutic Treatment*  
Many of today's cancer treatments include chemicals which damage a cell's DNA resulting in the inability of the cell to replicate and survive. For the chemotherapeutic treatments to be more effective, the relationship between DNA polymerase levels and the various drugs needs to be determined. This project would help define that relationship by studying the effect of chemotherapeutic drug on DNA polymerase levels in normal and carcinoma human colon cell lines.

### Anticipated Duration of Project

1/1/2010 - 12/31/2010

### Project Overview

The main objective of this project is to determine the levels of specialized polymerases within normal and carcinoma colon cell lines with and without treatment of cyclophosphamide, doxorubicin, and methylnitrosourea. The lines to be used include normal (LS123) as well as carcinoma (LoVo, HCT-8, HCT-15, HCT-116, and HT-29) cells. The level of expression of DNA polymerases will be determined at the protein level using Western Blot analysis. If time and expenses allow, expression at the RNA level will also be performed using the Quantitative Polymerase Chain Reaction procedure

In order to achieve the specific objectives of this project, several activities need to be completed including maintenance and treatment of the cell lines, isolation of protein (and possibly RNA) from the cells, and analysis of the collected samples. The data then needs to be analyzed to determine the levels of the various samples collected.

## **Principal Investigator**

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## **Other Participating Researchers**

None

## **Expected Research Outcomes and Benefits**

Two different comparisons of polymerase expression levels will be made during this project. The first is to compare normal and cancerous colon cell lines to determine if there are any changes. Since many treatments involved chemicals that affect polymerase function, it is also possible that cells undergoing treatment may produce a higher level of certain DNA polymerases than untreated cells. With an increased understanding of the expression levels of polymerases, the goal would be able to design more effective chemotherapeutic regimens.

## **Summary of Research Completed**

The first funds were received in April of 2010. From April until the end of June, five colorectal cell lines HCT-116 40-16, HCT-116 386, HCT-116 379.2, HCT-8, and HCT-15 have been cultured and protein samples have been isolated using Thermo Scientific NE-PER protein extraction kit. The start of western blot analysis for the normal levels of DNA polymerases is beginning. In addition, RNA samples have also been isolated using TRIZOL Reagent for the quantification of the level of gene expression for the same DNA polymerase genes by quantitative, reverse-transcriptase polymerase chain reaction. As described in our proposal's time line, during the period of June-August of 2010 our goal was to "Maintain cell lines and isolate untreated samples," which has been achieved.

Two West Chester University Biology students, Elizabeth Barchi and William Rolands have been performing the cell culture and isolations. Elizabeth Barchi graduated from the university in May and will be attending Penn State College of Medicine. William is a senior and will be completing the project.