

Dr. Levi Ekanger

FINAL REPORT



Project Title

The Effect of NO on DNA-Bound DNA Repair Enzymes with [4Fe-4S] Clusters

Type of Cancer

Colon and Rectal Cancer

Area of Research

Endogenous Factors in the Origin and Cause of Cancer

My work contributed to the ACS mission of eliminating cancer as a major health problem by discovering a new effect of the signaling molecule nitric oxide on DNA repair enzymes.

Nitric oxide is overproduced during chronic inflammation and leads to the progression of colon cancer. The mechanism by which nitric oxide progresses colon cancer is not understood at the molecular level. The central hypothesis to this proposal is that if nitric oxide reacts with DNA repair enzymes then the DNA repair enzymes will lose some of their important DNA repair function.

My work revealed that a DNA repair enzyme can still bind to DNA after it has reacted with NO. However, the electrochemical properties of the DNA repair enzyme are drastically altered by nitric oxide. The drastic change in electrochemical properties of a DNA repair enzyme might decrease the overall DNA repair capacity of the cell leading to a buildup of damaged DNA that could lead to cancer progression.



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