Cancer is the second most prevalent cause of death in the United States, surpassed only by heart diseases. According to the American Cancer Society, about 25% of deaths recorded in the U.S. are attributable to cancer. Cancer is often the result of gene malfunctions within a cell that cause the cell to grow and divide abnormally.

Research has shown that an excess of Ets-1 protein is found in many cancers, such as ovarian, breast and prostate. Ets-1 belongs to a class of proteins known as transcription factors; which are proteins that are important for turning gene expression on or off. Our research is focused on the pathways used by Ets-1 to regulate gene expression. In one pathway, Ets-1 binds to DNA and cell signaling via the Ras signaling pathway results in phosphorylation of the Ets-1 protein domain. This phosphorylation step recruits CBP (a co-activating transcription factor). Ets-1 interaction with CBP leads to acetylation of Ets-1 at specific acetylation sites and activated gene transcription. In colon cancer, mutations in Ras affect the regulation of downstream transcription factors, such as Ets-1. The study of Ets-1 and its regulatory pathways will help us understand the origins of cancer. This basic mechanism research will also guide the development of innovative methods of prevention and treatment of cancer at the molecular level.