

# Research finds single gene controls growth of some cancers

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Research led by Ashok Aiyar, PhD, Associate Professor of Microbiology at Louisiana State University Health Sciences Center New Orleans, showing that a single gene can control growth in cancers related to the Epstein-Barr virus and that existing therapeutics can inactivate it, will be published in online issue of *PLoS Pathogens*.

The Epstein-Barr virus (EBV) is closely associated with many human cancers such as Burkitt's lymphoma, Hodgkin's lymphoma, AIDS-related lymphomas, post-transplant lymphoproliferative disease, cancers of the nose and throat, and stomach [cancer](#). In many of these malignancies, proteins made by EBV are necessary for [tumor cells](#) to grow indiscriminately. This is especially true of AIDS-related lymphomas and post-transplant lymphoproliferative disease, which are serious complications of AIDS and transplant surgery. These cancers are responsible for thousands of deaths each year in the United States.

The LSUHSC research team, which also includes Kenneth Johnston, PhD, Professor of Microbiology, and Timothy Foster, PhD, Assistant Professor of Microbiology and faculty of the LSUHSC Gene Therapy Program, investigated a small region of a certain Epstein-Barr [virus protein](#) called EBNA1, to determine the role it plays in the activation of the EBV genes responsible for the indiscriminate growth of tumor cells in these cancers. Their research shows that EBNA1 is controlled by oxidative stress (pathologic changes in response to excessive levels of free radicals) within the EBV-infected cells. Varying levels of oxidative stress change EBNA1's ability to activate EBV genes responsible for

indiscriminate tumor cell growth.

"We have shown that in vitro, existing therapeutics such as Vitamin K that can change oxidative stress within cells, inactivate EBNA1," notes Dr. Aiyar, who is also a member of the faculty of the LSUHSC Stanley S. Scott Cancer Center. "As a consequence, EBV genes required for proliferation are no longer expressed, and malignantly transformed cells stop proliferating."

The research was funded by grants from the National Cancer Institute, the Louisiana Cancer Research Consortium, and the Department of Microbiology, Immunology, and Parasitology at LSU Health Sciences Center New Orleans School of Medicine.

"It is our hope that this research will lead to new ways of controlling EBV-associated diseases in humans," concludes Dr. Aiyar.

Source: Louisiana State University Health Sciences Center

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