

Gene could help predict response to cervical cancer treatment

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UCLA researchers have identified a potential diagnostic marker that could help predict how likely someone with cervical cancer is to respond to the standard treatment of chemotherapy and radiation.

The scientists found that PACS-1, a gene that resides on a small segment of the long arm of chromosome 11, is overexpressed in [cancer tissues](#),

which can result in [cancer](#) growth and spread. Further, they discovered that translocation of the PACS-1 protein from outside to inside the [cell nucleus](#)—a function required for normal cell growth—plays a role in the development of [cervical cancer](#) that is resistant to chemotherapy and radiation. Higher levels of PACS-1 expression in the nucleus could indicate resistance to the treatment, the researchers say.

Cervical cancer is the second leading cause of cancer-related death among women worldwide. While infection with human papillomaviruses plays a significant role in cervical cancer development, the presence of a virus alone is not enough to cause cancer; genetics and [environmental factors](#) such as smoking and poor eating habits also play a role. Therefore, it is important to identify biological markers as targeting agents for diagnosis and treatment.

The researchers performed a western blot, a technique for detecting specific protein molecules from among a mixture of proteins, on cervical tumors and healthy cervical tissue and discovered an overexpression of PACS-1 in the tumor tissues. The team then developed in vitro human cell line models to assess the protein's role in cell growth. Finally, they used a fluorescence-activated sorter analysis to help determine if the overexpression of PACS-1 protein was associated with cancer chemo resistance.

If confirmed in animal studies, the use of PACS-1 as a diagnostic marker could help lead to the development of therapeutic strategies to overcome treatment resistance in cervical cancer. Alternative methods of treatment, including the inhibition of PACS-1 expression, could be used in combination with chemotherapy or immune system-activating agents.

The study's senior author is Eri Srivatsan, a professor of surgery at the David Geffen School of Medicine at UCLA and member of UCLA's Jonsson Comprehensive Cancer Center and Molecular Biology Institute.

The first author is Mysore Veena, a scientist at the Geffen School of Medicine.

The study is published online in the *Journal of Biological Chemistry*.

More information: Mysore S. Veena et al, Dysregulation of hsa-miR-34a and hsa-miR-449a leads to overexpression of PACS-1 and loss of DNA damage response (DDR) in cervical cancer, *Journal of Biological Chemistry* (2020). [DOI: 10.1074/jbc.RA120.014048](https://doi.org/10.1074/jbc.RA120.014048)

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