

BUSM researchers study epigenetic mechanisms of tumor metastasis for improved cancer therapy

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A review article by researchers at Boston University School of Medicine (BUSM) suggests that epigenetics may be a useful target to stop the growth, spread and relapse of cancer. The findings are published online in Volume 14 of the *International Journal of Molecular Science*.

The term epigenetics refers to the external modifications to DNA that turn genes "on" or "off." These modifications do not change the DNA sequence, but instead, they affect how cells read genes.

The researchers propose that epigenetic and other changes mediate the development of [cancer](#) progenitor cells. These cells represent the early stage of cancer cell development and can grow rapidly to become full-fledged cancer. According to the researchers, progression of different cancer stages and development of metastatic potential requires differentiation of these cancer progenitor cells.

"These findings are not only important in understanding how cancer progresses, but also help in understanding how cancer progenitor cells grow and differentiate via epigenetic regulators," said Sibaji Sarkar, PhD, instructor of medicine at BUSM.

Mutated cells are more vulnerable to the environment. Some of these mutations may alter epigenetic regulation in addition to epigenetic changes occurring by external and internal influences, which impacts gene expression and regulates cell behavior, playing a profound role when normal cells develop into progenitor [cancer cells](#).

Sarkar and his colleagues hypothesize that when the progenitor cancer [cells](#) metastasize, rapid

growth halts. When differentiation is complete, the rapid growth resumes.

The researchers believe that [epigenetic mechanisms](#) are involved in this process. Once a degree of metastatic form of cancer is achieved, the genes, which cause the change, become inactive and the [genes](#) causing rapid growth are again turned on.

"The acknowledgement of [epigenetic changes](#) as key regulators of this switching is expected to generate better epigenetic drugs. It has been suggested that epigenetic drug treatment in combination with standard chemotherapeutic drugs may have better outcomes in preventing and treating drug-resistant cancers," he added.

Provided by Boston University Medical Center

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