

Researchers identify a key enzyme that affects radiation response

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Cancer researchers at Princess Margaret Hospital (PMH) have discovered that targeting an enzyme called Uroporphyrinogen Decarboxylase (UROD) can sensitize diseased tissue to radiation and chemotherapy, which could mean fewer side effects for individuals with head and neck cancer.

The findings, published online today in [Science Translational Medicine](#) are significant because they suggest that targeting UROD – identified for the first time as a key player in human cancers – can selectively boost the effects of radiotherapy and [chemotherapy](#) in head and neck tumors, while minimizing toxicity to normal tissues.

"Our analysis of patient biopsies revealed that UROD levels were significantly higher in tumor tissues versus normal tissues. [Cancer](#) patients with lower UROD levels prior to radiation treatment had improved clinical outcome, suggesting that UROD could potentially be used to predict patients' response to radiation therapy," says principal investigator, Dr. Fei-Fei Liu, Professor of Radiation Oncology at the University of Toronto and PMH, and Senior Scientist at the Ontario Cancer Institute and The Campbell Family Cancer Research Institute.

Lead author Dr. Emma Ito adds: "This means that lower doses of [radiation](#) and chemotherapeutic drugs could potentially be administered to patients without affecting treatment efficacy."

"Despite the advances over the last few decades, the toxic side effects

associated with current therapies for head and neck cancer have caused disappointing outcomes in many patients," says Dr. Ito. Head and neck tumors are often found near critical structures, so destroying the diseased tissue is often a delicate challenge that can lead to life-threatening conditions.

"UROD is an enzyme involved in the production of a molecule called heme, which is vital to all body organs. Targeting UROD creates an opportunity to exploit the heme synthesis pathway, which disrupts the equilibrium of iron and free radical levels in cells which in turn kills cancer cells." says Dr. Liu.

More information:

<http://stm.sciencemag.org/lookup/doi/10.1126/scitranslmed.3001922>

Provided by University Health Network

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