

News Highlights

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Discovery of Metabolic Alterations Caused by BAP1 Gene Mutations

HONOLULU – Dr. Michele Carbone, the University of Hawai'i Cancer Center's director of Thoracic Oncology, and his team discovered the metabolic alterations caused by BAP1 gene mutations. The normal cells of individuals born with mutations of the BAP1 gene derive energy through aerobic glycolysis which produces lactic acid, rather than respiration, and thus display a set of metabolic alterations known as the Warburg Effect, which so far was considered an indication of cancer cells.

The findings published in *Cell Death and Differentiation* provide the first experimental evidence that the Warburg Effect, does not necessarily occur as an adaptive process that is a consequence of a cell becoming cancerous, but rather that it may also predate malignancy by many years and facilitate cancer development.

The discovery explains why individuals who are born with germline BAP1 mutations have so far developed at least one and often multiple cancers in their lifetime. About 20 percent of all cancers have BAP1 mutations. Carbone and collaborators are now developing novel strategies to correct these metabolic alterations to prevent cancer in people born with BAP1 mutations.

Dr. Carbone's work is the result of teamwork with collaborators and experts in different fields of science and medicine. Dr. Carbone's research team collaborated with the research teams of Drs. Haining Yang and Wei Jia at the UH Cancer Center, and with researchers at New York University and University of Ferrara, Italy.

BAP1 cancer syndrome

In 2011, Dr. Carbone and colleagues discovered "the BAP1 cancer syndrome" uncovering why certain families had a high incidence of mesothelioma, a cancer caused mostly by asbestos, melanoma and other cancers.

"I want to prevent and cure cancer in as many people as possible. We have been fortunate to see that our research and discoveries have already led to preventive measures that are expected to save many lives in the coming years. Now I want to develop a new therapy to help those who have cancer," said Dr. Carbone.

Publication

Cell Death and Differentiation: <http://owl.li/Vwio3odijG1>

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The University of Hawai'i Cancer Center through its various activities, cancer trial patients and their guests, and other visitors adds more than \$54 million to the O'ahu economy. It is one of only 69 research institutions designated by the National Cancer

Institute. Affiliated with the University of Hawai'i at Mānoa, the Center is dedicated to eliminating cancer through research, education, patient care and community outreach with an emphasis on the unique ethnic, cultural, and environmental characteristics of Hawai'i and the Pacific.

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