

News Highlights

June 14, 2017

DR. MICHELE CARBONE AND HIS TEAM DISCOVERED WHY SOME PEOPLE ARE MORE SUSCEPTIBLE TO ENVIRONMENTAL CARCINOGENS

HONOLULU – The University of Hawai'i Cancer Center's director of Thoracic Oncology, Dr. Michele Carbone and his team, discovered why people carrying mutations of a gene called BAP1 are much more susceptible to asbestos, sunlight and other environmental carcinogens.

They also found that cancer cells with a BAP1 gene mutation are resistant to chemotherapy. About 20 percent of all cancers have BAP1 mutations.

The findings published in Nature highlight how the BAP1 gene regulates a channel (IP₃R₃) inside cells that moves calcium. When the BAP1 gene is mutated or damaged, calcium levels inside the cells decrease. The decrease of calcium makes cells more likely to become malignant when exposed to environmental carcinogens.

BAP1 mutations make up tumor cells of:

- 70 percent of mesotheliomas
- 90 percent of eye melanomas
- 90 percent of renal cell carcinomas

Two ways you can get a BAP1 mutation:

- Some people are born with the mutation
- BAP1 gets damaged in the process that the cell becomes cancerous

"We found that cancer cells become much more responsive to chemotherapy when BAP1 levels are restored and calcium channels are fixed and stabilized. The fixed channel should be able to prevent cancer in people who have inherited BAP1 mutations and to help treat cancers whose tumor cells have developed BAP1 mutations," said Carbone.

BAP1 cancer syndrome

In 2011, Carbone and colleagues discovered "the BAP1 cancer syndrome" uncovering that certain families had a high incidence of cancers including mesothelioma, a cancer generally caused by asbestos.

The new findings explain how and why mutations of BAP1 increases cancer incidence.

"The publication of the findings in Nature the premier scientific journal in the world

shows the power of collaboration and the fact that we can overcome our geographical isolation making Honolulu the place where scientists from Asia, Europe and the mainland meet to work together to find new ways to fight cancer," said Dr. Haining Yang, co-author and researcher in the Center's Cancer Biology Program.

"We want to prevent and treat cancer in as many people as possible. We hope to start a clinical trial, within 5 years or less, to test the susceptibility to chemotherapy in patients with BAP1 mutated tumors," said Carbone.

"Publishing in Nature, is like winning an Oscar for a scientist, very few do so in their career. I came to Hawai'i all the way from Italy and I achieved my dreams. I very much hope that our discovery will help save many lives," said Angela Bononi, co-author and post-doctoral fellow in Dr. Carbone's lab.

Nature Publication

<http://dx.doi.org/>

DOI: 10.1038/nature22798

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.

Learn more at www.uhcancercenter.org. Like us on Facebook at

www.facebook.com/UHCancerCenter. Follow us on Twitter [@UHCancerCenter](https://twitter.com/UHCancerCenter).