New understanding of why cancer cells move

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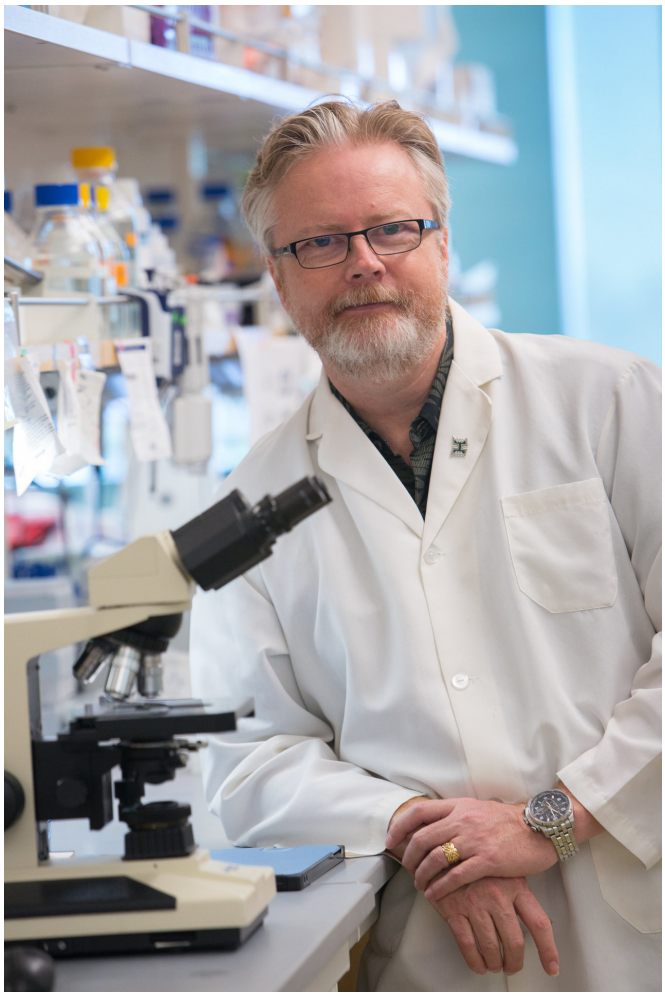

Joe W. Ramos, deputy director of the UH Cancer Center. Credit: University of Hawaii Cancer Center

A University of Hawai'i Cancer Center researcher has identified how some cancer cells are made to move during metastasis. The research provides a better understanding of how cancer spreads and may create new opportunities for cancer drug development.

Metastasis causes the deaths of 90 percent of cancer patients. The spread of cancer by metastasis is driven by a set of mutant proteins called oncogenes which cause cancer cells to multiply uncontrollably and promotes their ability to move. How oncogene activity specifically directs the increased movement and metastasis is highly complex and remains largely unknown.

Joe W. Ramos, PhD, deputy director of the UH Cancer Center and collaborators focused on investigating how these oncogenes and related signals lead to dysregulation of normal processes within the cell and activate highly mobile and invasive cancer cell behavior.

The findings, published in *Proceedings of the National Academy of Sciences* (*PNAS*), define a mechanism in which the oncogenes turn on a protein called RSK2 that is required for cancer cells to move. Ramos and colleagues found that the RSK2 protein forms a signaling hub that includes proteins called LARG and RhoA. They show that turning on this signaling hub activates the movement of the cancer cells. These results significantly advance understanding of how cancer cells are made to move during metastasis and may provide more precise targets for drugs to stop cancer metastasis in patients where there are oncogenic mutations.

"These new data are very exciting. Blocking cancer invasion and metastasis remains a central challenge in treating patients. We anticipate that this research may lead to new therapeutic opportunities for brain tumors, melanoma, and breast cancer among others. We are currently focused on these opportunities and developing new compounds to target this signaling hub," said Ramos.

More information: Geng-Xian Shi et al, RSK2 drives cell motility by serine phosphorylation of LARG and activation of Rho GTPases, *Proceedings of the National Academy of Sciences* (2017). DOI: 10.1073/pnas.1708584115

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