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# Researchers develop new way to combat drug resistance for melanoma patients

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Moffitt Cancer Center researchers developed a new way to identify possible therapeutic targets for patients with drug resistant melanoma. It involves using liquid chromatography-multiple reaction monitoring mass spectrometry to measure biomarkers or molecules in blood and tissue that indicates cancer is present. These measurements can help researchers determine if a patient is responding to treatment.

Scientists have made significant strides identifying important molecules that contribute to melanoma growth and metastases, such as the proteins BRAF and MEK. Therapeutic agents that target these molecules have shown promise in the clinic, and many patients have significant reductions in tumor growth and tumor burden.

"While targeted therapy drugs, such as BRAF and MEK inhibitors, have been associated with impressive responses in melanoma patients, most patients will eventually fail therapy," said Keiran Smalley, Ph.D., associate member of the Cancer Biology and Evolution Program at Moffitt.

Tumors can develop different resistance mechanisms and adapt to targeted agents in order to survive and continue to grow. "It is likely that long-term management of melanoma patients will require combinations of drugs," said Smalley.

The molecular changes that lead to drug resistance vary between patients and each tumor. Identifying these molecular alterations with current

scientific approaches is difficult, costly and time-consuming.

Smalley's team, in conjunction with the lab of John Koomen, Ph.D. of Moffitt's Chemical Biology and Molecular Medicine Program, developed a liquid chromatography-multiple reaction monitoring mass spectrometry assay to analyze more than 80 proteins known to be important in melanoma progression and resistance to targeted therapies. They showed that melanoma cells that are resistant to drugs that target MEK have alterations in a number of different cell signaling pathways. Results like this will allow for the development of new treatment strategies.

The researchers plan to expedite the identification of proteins involved in melanoma drug resistance through the use of liquid chromatography-multiple reaction monitoring mass spectrometry. The platform allows the simultaneous detection of multiple proteins in small quantities of tissue samples. It also results in highly reproducible data that can be easily validated among different laboratories.

**More information:** Their study is the cover story of the July issue of *Molecular and Cellular Proteomics*: www.mcponline.org/content/earl … M113.037424.full.pdf

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