Immuno-PET can give physicians early insight into tumor response to targeted therapy

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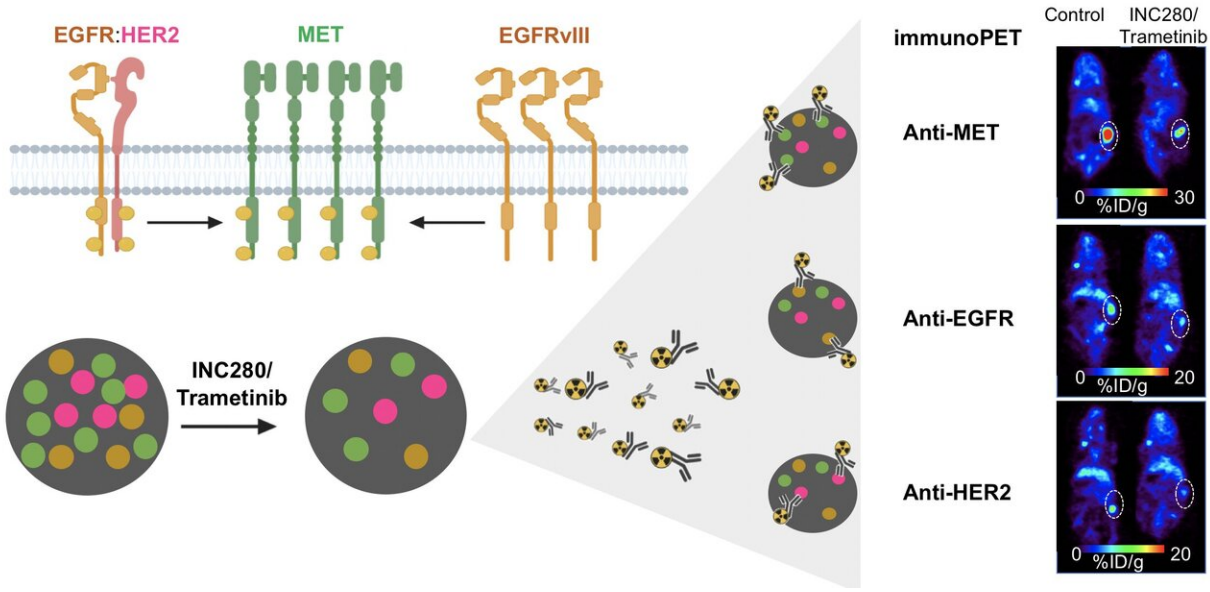

Three receptor tyrosine kinases (RTKs)--EGFR (orange), HER2 (pink), and MET (green)--are imaged before and after the use of a MET-selective tyrosine kinase inhibitor (Trametinib), and trametinib, a mitogen activated protein kinase (MEK) inhibitor, showing its potential effectiveness for treating a tumor. Credit: Patricia Pereira, PhD, Research Associate at Memorial Sloan Kettering Cancer Center

Immuno-positron emission tomography (PET) imaging can provide early insight into a tumor's response to targeted therapy, allowing physicians to

select the most effective treatment for patients who have cancer. The new research was published in the March issue of The *Journal of Nuclear Medicine*.

The research showed that immuno-PET successfully visualizes changes in different cancer receptors (receptor tyrosine kinases, or RTKs) within tumors during targeted therapies. This gives physicians a tool that can be used to evaluate the effectiveness of a treatment soon after its administration.

"When healthy cells turn into cancer cells, there is a disruption in the RTK signaling. This makes RTKs a valuable therapeutic and imaging target," said Patricia Pereira, Ph.D., a research associate at Memorial Sloan Kettering Cancer Center in New York, New York. "Techniques that allow for real-time monitoring of RTK dynamics, such as immuno-PET, could be very beneficial in informing treatment choice and predicting response."

Immuno-PET uses a "tracer" to follow an antibody directed to a specific tumor. This allows physicians to obtain images of events happening at the tumor site and provides information into whether the tumor responds to the treatment. The physician can then visualize how the tumor is responding.

In this study, researchers used immuno-PET and three different antibodies to visualize three RTKs (MET, EGFR, and HER2) in a kidney tumor. Their results confirmed that immuno-PET visualizes RTKs in ways that determine the level of protein within a tumor. After administering a treatment, immuno-PET can detect changes in RTK levels that indicate whether a tumor is responsive to that treatment.

"Precision medicine involves the identification of certain gene mutations and expressions, as well as other features, that contribute individual

tumor signatures," noted Pereira. "Our study shows that immuno-PET is a powerful technique to document RTK changes and predict tumors' response to targeted therapies."

More information: Patricia M.R. Pereira et al, Immuno-PET Detects Changes in Multi-RTK Tumor Cell Expression Levels in Response to Targeted Kinase Inhibition, *Journal of Nuclear Medicine* (2020). DOI: 10.2967/jnumed.120.244897

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