InSyTe FLECT/CT Application Spotlight

Cancer Imaging

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Title: Targeting Activated Platelets: A Unique and Potentially Universal Approach for Cancer Imaging
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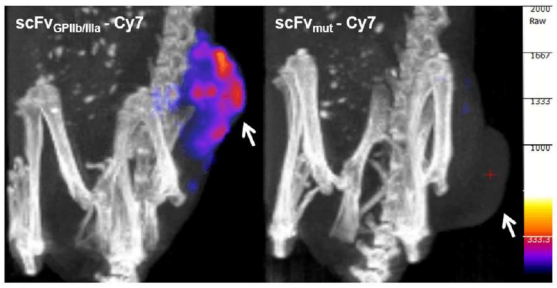
Summary: Molecular imaging is an established field of research that combines molecular biology and in vivo imaging. Visualization of cellular function and molecular processes is possible without damaging or disturbing the biological environment. Selective targeting in cancer imaging is the combination of biomolecules with specific molecular markers and sensitive, non-invasive imaging techniques. In this application spotlight, a team of researchers from the Baker Heart and Diabetes Institute in Melbourne, Australia, report on a special type of activated platelet that accumulate locally within cancer tumors that provide molecular imaging capabilities. $scFv_{GPIIB/IIa}$ (the biomolecule) has been conjugated to Cy7 (the fluorescent dye), which then binds to a receptor on activated platelets that are expressed in cancer cells. The researchers implanted xenograft tumors in mice to assess performance of the probe *in vivo*. The probe was also created in different versions as a PET and ultrasound contrast agent, which was then verified *in vivo*, using multiple imaging modalities, including the InSyTe FLECT/CT.



At 2 hours post injection, the figure on the right demonstrates localization of the biomolecule within the tumor near the surface of the skin in the animal. Brighter colors indicate higher fluorescence accumulation and localization within the tumor site.

The authors used the InSyTe FLECT/CT to assess probe localization in a preclinical model of SKBr3 xenograft tumors. The figure on the left demonstrates the InSyTe FLECT/CT capabilities of fusing 3D tomographic fluorescence with X-Ray CT data. At 20 hours post injection, local distribution and concentration of probe are visualized.

InSyTe FLECT/CT Spotlight: Using the InSyTe FLECT/CT, the research team was able to visualize localization of the probe *in vivo* at 2 and 20 hours post injection. The research team demonstrated the ability of the probe to target and image activated platelets as a general component of the tumor microenvironment. They were able to utilize the InSyTe FLECT/CT capabilities in visualizing their cancer probe localization and tumor distribution within their preclinical cancer model.