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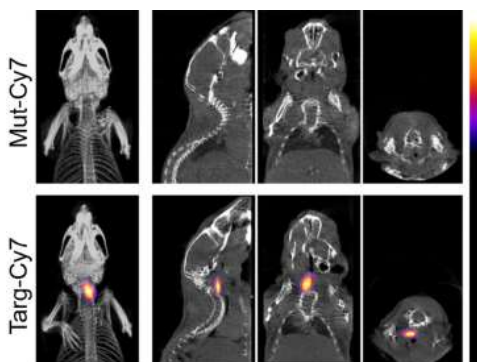
Title: A Unique Recombinant Fluoroprobe Targeting Activated Platelets Allows In vivo Detection of Arterial Thrombosis and Pulmonary Embolism Using a Novel Three-Dimensional Fluorescence Emission Computed Tomography (FLECT) Technology

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Keywords: Probe development, Cardiovascular, Diagnostics, Vascular Biology

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 cardiovascular research 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 fluoroprobe (Targ-Cy7) that binds exclusively to activated platelets to provide molecular imaging capabilities. The fluoroprobe consists of a single chain antibody fragment specific for the glycoprotein IIb/IIIa receptor (the biomolecule) conjugated to Cy7 (the fluorescent dye), which then binds to a receptor on activated platelets that are expressed in a carotid artery induced injury. The researchers induced an injury to the carotid artery in mice to assess performance of the probe *in vivo*. The probe was verified using optical imaging and using *ex vivo* methods, as well as monitoring of the injury progression and subsequent response to target drugs over time. The InSyTe FLECT/CT was utilized to study mechanisms of thromboembolic diseases and is highlighted as a method that uses non-radioactive probes, is low cost, has high sensitivity and is an attractive development for future clinical applications.

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 result of creating an injury to the carotid artery. They were able to utilize the InSyTe FLECT/CT capabilities in visualizing their probe localization within their preclinical cardiovascular model.



The authors used the InSyTe FLECT/CT to assess probe localization in the left carotid artery thrombus. The figure on top shows the mutant version of the biomolecule that does not accumulate in the carotid artery. This is an example of the clinical grade soft tissue contrast of the CT system. The bottom figure illustrates the Targ-Cy7 reconstructed fluorescence data co-registered with the X-Ray CT data. This data was taken during an animal survival study.