

Labeled Prothrombin to Detect Bacterial Endocarditis

Posted By [Stanley Darma](#) On August 22, 2011 @ 2:01 pm In [in the news...](#) | [No Comments](#)

3

Like

• [Tweet](#) [1]

0

•

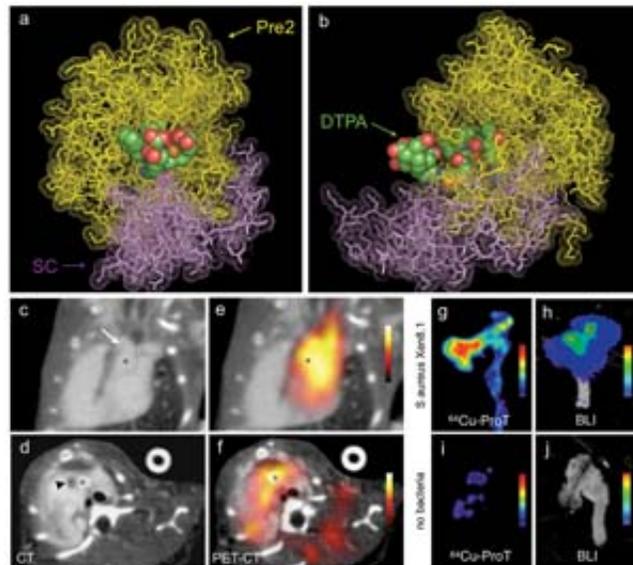
• [Share](#)

Researchers from Massachusetts General Hospital have successfully explored the possibility of using prothrombin to identify coagulase-positive *Staphylococcus aureus*-associated endocarditis. In their study they used an engineered radio-labeled analog of prothrombin as an imaging probe to detect *S. aureus* vegetations on heart valves of mice using PET-CT.

In their search for a targeted imaging strategy, they exploited the ability of *S. aureus* to clot human blood. Staphylocoagulase, an enzyme secreted by *S. aureus* bacteria, binds prothrombin and after activating it, it forms a staphylocoagulase-prothrombin complex which has all the fibrinogen-clotting abilities, but is not affected by physiologic thrombin inhibitors. Knowing this, the investigators engineered prothrombin analogs as imaging probes.

Eventually they were able to detect the radio-labeled agents deposited into *S. aureus*-induced vegetations with PET-CT. This shows promise for future use in human patients, if the researchers succeed in developing this technique further and are able to acquire regulatory approval for it.

Image: PET-CT image of *S. aureus* endocarditis. Images A and B show a molecular model of how the PET reporter (yellow structure with colored spheres) binds to the target, the bacterial enzyme staphylocoagulase (violet). Image B is rotated 90 degrees relative to image A. CT (images C and D) and PET-CT (images E and F) show location of the radiolabeled prothrombin in vegetations (arrowhead) around the aortic valve (asterisk) of a mouse heart. Images G-I show location of the PET agent in aortas of mice with (G-H) and without (I-J) *S. aureus* endocarditis.



Link: [Imaging probe allows noninvasive detection of dangerous heart-valve infection ...](#) [2]

Abstract in *Nature Medicine*: [In vivo detection of Staphylococcus aureus endocarditis by targeting pathogen-specific prothrombin activation](#) [3]

Article printed from Medgadget: <http://medgadget.com>

URL to article: <http://medgadget.com/2011/08/labeled-prothrombin-to-detect-bacterial-endocarditis.html>

URLs in this post:

[1] Tweet: <http://twitter.com/share>

[2] Imaging probe allows noninvasive detection of dangerous heart-valve infection ...:
<http://www.massgeneral.org/about/pressrelease.aspx?id=1398>

[3] In vivo detection of Staphylococcus aureus endocarditis by targeting pathogen-specific prothrombin activation: <http://www.nature.com/nm/journal/vaop/ncurrent/full/nm.2423.html>

Copyright © 2011 Medgadget DEV. All rights reserved.