New imaging method detects fungal infections caused by Aspergillus fumigatus faster than before

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Dynamic $[^{18}\text{F}]$FCB PET/CT imaging in control animals. (A) Maximum intensity projections of imaging frames at different time points (indicated above each image) obtained in a representative control mouse following the intravenous injection of $[^{18}\text{F}]$FCB. Time activity curves (TACs) from (B) the IVC (to
Researchers at the National Institutes of Health's (NIH) Clinical Center and the National Heart, Lung and Blood Institute have developed and tested a new imaging method that will allow specific detection of Aspergillus fumigatus fungal infections in a timely manner in the future, without the need for invasive procedures. Delays in diagnosing fungal infections caused by Aspergillus and other fungi can put immunocompromised patients at risk for more serious illnesses or even death.

The study is published in the journal *Science Translational Medicine*.

Due to their presence in the environment, many fungi evolved to use other sources of fuel besides glucose, such as by breaking down complex sugars into simple ones to produce energy. Aspergillus can break down a specific sugar, cellobiose, into two glucose molecules, while most other microbes and human cells cannot. The researchers developed a radioactive version of cellobiose, which—when injected in the blood—can be visualized in the body using *positron emission tomography* (PET) scanners.

In this study, radioactive cellobiose ([\(^{18}\text{F}\)]-Fluorocellobiose, [\(^{18}\text{F}\)]-FCB) was injected in mice with fungal infections which were then imaged using a specialized PET scanner for small animals. The mice showed accumulation of radioactivity, while mice with bacterial infections or with noninfectious inflammation did not.

Researchers also found that the same radioactive tracer, [\(^{18}\text{F}\)]-FCB, can
determine whether the mice with fungal infections are responding to treatment through PET images taken before and after starting treatment.


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