Medical Xpress

Animal TB 'tracker' to speed drug and vaccine studies

July 22 2009

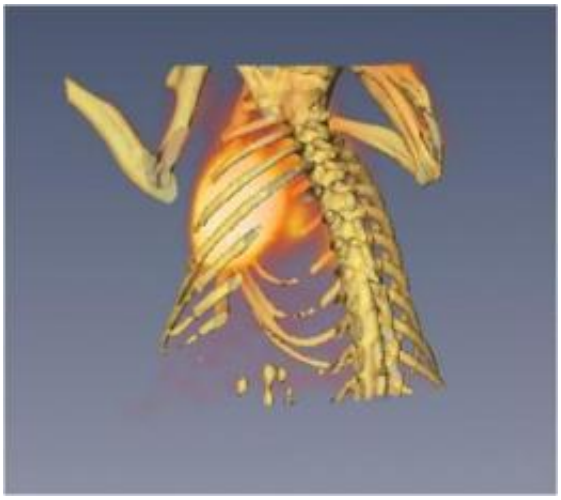
Investigator Sanjay Jain, M.D., of Hopkins Children's, prepares a mouse for imaging with his newly designed TB tracker that allows researchers to monitor the disease in real time. Credit: Johns Hopkins Children's Center

Johns Hopkins researchers have developed a novel way to monitor in real time the behavior of the TB bacterium in mouse lungs noninvasively pinpointing the exact location of Mycobacterium tuberculosis. The new monitoring system is expected to speed up what is currently a slow and cumbersome process to test the safety and efficacy of various TB drug regimens and vaccines in animals. Plans are already under way for developing a similar system to monitor TB disease in humans.

A report on the system appears in the July 16 issue of the online journal Public Library of Science (*PLoS One*).

"Worldwide there are some 9.2 million new infections with TB each year, and new drug combinations are needed fast to treat increasingly resistant strains of the bacterium," says senior investigator Sanjay Jain, M.D., an infectious disease specialist at Johns Hopkins Children's Center and director of the Center for Infection and Inflammation Imaging Research in the Division of Infectious Diseases at Hopkins. "Because virtually all drugs are tested in animals first, the TB tracker will play a critical role in such preclinical studies."

"This new way to locate and study the disease and its behavior in animals should speed studies of TB's response to experimental vaccines, to new drugs and old ones and should accelerate our assessment of whether a treatment is working or not," Jain added.



A mouse imaged with the new TB monitoring system shows areas of inflamed lung tissue caused by TB. Credit: Johns Hopkins Children's Center

TB treatment in humans and animals takes much longer than treating other bacterial infections, so compliance with lengthy and complicated regimens can often be problematic. Also, some strains are already

resistant to all drugs currently available, so finding clues to how the bacterium responds to drug treatment is essential.

In mice, the tracker works by infecting them with a "designer" strain of TB, developed by the Hopkins team to absorb radio-tracing chemicals. The chemicals light up the germ and any infected tissues in the lung, permitting an image captured by CT, PET and SPECT scanners.

Because the new system tracks disease progression over time within the same group of live animals, fewer animals are needed than in conventional animal testing protocols.

The tracker will be useful for studying TB in larger animals, including rabbits, guinea pigs and nonhuman primates, whose TB infection mimics human disease much more closely than infection in mice.

Source: Johns Hopkins Medical Institutions

Citation: Animal TB 'tracker' to speed drug and vaccine studies (2009, July 22) retrieved 2 May 2024 from https://medicalxpress.com/news/2009-07-animal-tb-tracker-drug-vaccine.html