

Dirty-bomb test for terror may aid cancer research

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WASHINGTON (AP) - With a few drops of blood, scientists are creating a way to tell who's absorbed dangerous radiation levels, part of the government's preparations against a terrorist attack _ and research that just might point toward new cancer care, too.

Duke University's work aims to allow rapid triage in wake of a dirty bomb explosion or other radiological emergency, to sort out who among potentially thousands of panicked people need treatment for radioactive fallout and who can go home. At the same time, it illustrates an evolving new approach to developing so-called "medical countermeasures" for defense: They ought to have an everyday use, too.

"There has to be a return on investment from this program in peacetime," Dr. Nicole Lurie, assistant secretary for preparedness at the Health and Human Services Department, told The Associated Press.

At issue: The nation's stockpile of treatments, vaccines and tests against bioterrorism and chemical or radiological threats. Saying the arsenal isn't growing fast enough, HHS Secretary Kathleen Sebelius ordered a major review of how to jumpstart the development of countermeasures. That process now is spurred by contracts from the federal Biomedical Advanced Research and Development Authority, or BARDA, that help fund research of promising products, often with guaranteed purchase of a certain amount if the work pans out.

"There are gaps at every stage in the process, from the laboratory to the factory floor, that are slowing or stalling the development of key countermeasures," Sebelius said in announcing the review.

HHS' recommendations are expected later this spring, encompassing areas from industry's call for more reliable financing to how to prioritize the most urgent needs.

But in meetings with scientists and manufacturers, already officials are urging creation of countermeasures with a wider commercial use rather than ones focused solely on potential terrorism, so that more profit-driven companies might sign on to do the work _ and so that more people might benefit.

"The dual use is really where my heart is," says Duke hematology specialist Dr. John Chute, who discovered a genetic signature of radiation exposure detectable in blood within hours _ and then won a five-year BARDA contract worth up to \$43 million to turn the discovery into an emergency test.

The flip side: That genetic activity _ it predicts whether certain key blood cells live or die _ allows study of pathways that might help cancer patients' battered immune systems regenerate after intense therapy, like the whole-body radiation people undergo before receiving a bone marrow transplant.

"It hits right in our wheelhouse of research," says Chute, who also has begun animal research with a potential drug to spur growth of blood-forming stem cells after radiation damage.

Moreover, "radiation is just one type of problem you could be detecting," he adds.

Duke's partners _ California-based DxTerity Diagnostics, Arizona State University and Australia's Invetech Corp. _ are developing the hand-held machines needed to make Chute's test quick and portable enough to take straight to an emergency site. He says that machinery "has huge potential" for more rapid diagnosis of conditions from cancer to infections, tests that today take days in standard labs.

Outside of an immediate blast zone, there's no fast way to detect radiation poisoning _ yet many of the injured could survive if only they were diagnosed and treated quickly, Chute explains.

Immune cells called lymphocytes that circulate in the blood are super-sensitive to radiation, so it was there Chute began the hunt for genes that switch on and off in response. He found a pattern that predicted radiation poisoning in mice. Then he took samples of blood from cancer patients headed for a bone marrow transplant before and six hours after they were irradiated _ and found a signature from just 25 genes that was 94 percent accurate in distinguishing who was irradiated. Next, he's working on teasing out the dose they received.

But it took days to test each blood sample. How to speed it up? That's where Chute's partners come in, with an automated method of reading genetic activity that promises an answer within an hour _ and a desktop-sized machine to process droplets of blood that's already being developed for real-time DNA fingerprinting at crime scenes. The idea: Each machine could test a fingerstick of blood from a few dozen people an hour, with multiple machines dispatched to an emergency to handle the crowds.

Merging the test and the technologies, Chute hopes to have a prototype machine in 2012, ready for a large study using blood collected from bone marrow transplant patients at several major cancer centers to prove if the approach really works.

Yet without the government's push for countermeasures, he says he wouldn't have tried to speed up his radiation test _ the dayslong version worked fine for cancer research.

EDITOR'S NOTE _ Luran Neergaard covers health and medical issues for The Associated Press in Washington.

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