Cancer diagnosis breakthrough

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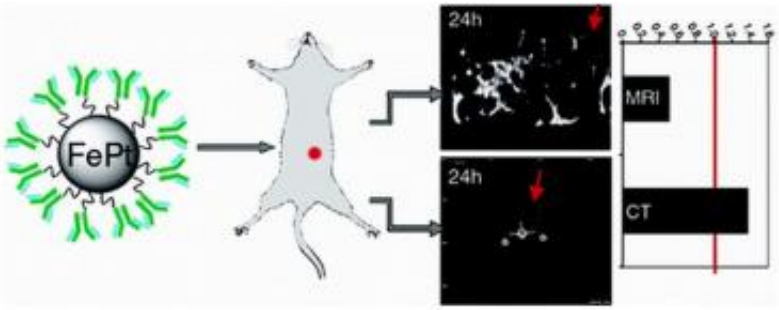

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(PhysOrg.com) -- Researchers in Taiwan have developed a new imaging contrast agent that will enable cancer patients to undergo CT and MRI scans on the same day, cutting diagnosis time in half.

When cancer patients undergo computerized tomography (CT) or magnetic resonance imaging (MRI) scans, they are injected with an imaging contrast agent, and they must wait at least 24 hours for the previous contrast agent to clear before having the next scan. Now, for the first time, a research team in Taiwan has developed a contrast agent that can be used for both scans.

The new technology was developed by a team led by Professor Chen Chia-chun of Academia Sinica and the Chemistry Department of the National Taiwan Normal University in Taipei, and Professor Shieh Dar-bin, a doctor and lecturer at the National Cheng Kung University

Institute of Oral Medicine and the Department of Stomatology in Tainan.

CT and MRI scans are time-consuming and expensive, and many patients have to wait up to two months to be examined so that a diagnosis can be confirmed. Professor Chen said some patients also develop side effects to the contrast agents currently used with the scans. Having a single contrast agent means the patient only needs one injection and can have both scans on the same day.

The new contrast agent for both CT and MRI scans consists of a water soluble alloy of iron (Fe) and platinum (Pt) nanoparticles up to 12 nanometers in diameter. The particles have been tested in vitro and in vivo and found to be stable and to have excellent biocompatibility and hemocompatibility. The FePt nanoparticles can also be mass produced, which would reduce their cost.

The new contrast agent shows the exact position of the tumor cells and the molecular characteristics of cancer lesions, which will help doctors to determine the best kind of chemotherapy to use on each patient.

The system will not be commercially available until clinical human trials have been completed, which will take approximately five years. When it does become available, Chen predicts it will become “a star product in the world’s nearly US$5 billion medical diagnosis market.”

The research results were published as a cover story in the *Journal of the American Chemical Society* on 29 September. The work was partly funded by the National Science Council. Patent applications have been made around the globe.

More information: Shang-Wei Chou et al., In Vitro and in Vivo Studies of FePt Nanoparticles for Dual Modal CT/MRI Molecular

Imaging, J. Am. Chem. Soc., 2010, 132 (38), pp 13270-13278.
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