

Arteries better than veins for liquid biopsy

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As the field of liquid biopsies for tracking disease progression and therapeutic response heats up, many doctors are looking for ways to apply this approach to their patients. Currently, assays for circulating tumor cells (CTCs) - one type of liquid biopsy - have been approved for diagnostic purposes in metastatic breast, colorectal, or prostate cancer. In these diseases, the presence of CTCs in the peripheral blood is associated with decreased progression-free survival and decreased overall survival. The major challenge for this technology is that CTCs are not always found in the blood of patients with aggressive disease who would be expected to have high numbers. Now, researchers at Thomas Jefferson University investigating uveal melanoma, a type of melanoma that originates in the eye, have shown that the low numbers could simply be explained by where the blood is drawn - whether from a vein or an artery.

In breast cancer, a high number of CTCs (more than 5 cells in 7.5 ml of [blood](#) collected from the veins) indicates aggressive [metastatic disease](#), or disease that has stopped responding to treatment. "If we can validate this approach for uveal melanoma, we hope to be able to catch cancer before it develops into metastatic disease," says Takami Sato, M.D., the K. Hasumi Professor of Medical Oncology at Thomas Jefferson University and lead investigator on the paper. "The work by Dr. Mizue Terai and others at Jefferson gives us hope that CTC might be useful for uveal melanoma patients as well. On the other hand, our research raised a concern that venous blood specimens, which are tested as the standard practice for CTC measurement, might not be the best source for CTC detection." The results were published online in the journal *EBioMedicine*.

Circulating [tumor cells](#) are larger than other blood cells and have different characteristics from normal blood cells. Therefore, CTCs can be detectable in the blood samples with modern technology. Most commonly, blood samples are obtained from a patient's vein, which has already passed through an intricate sieve of narrow

capillaries throughout the body before draining to the veins. Indeed, when Mizue Terai, PhD and colleagues compared [blood samples](#) taken from uveal melanoma patients' veins compared to that collected from arteries, they saw a much higher number of circulating tumor cells in blood collected from the arteries than in the veins. In fact, all of the uveal melanoma patients with multiple liver metastasis had CTCs present in their arterial blood, while only 53 percent of blood sampled from the veins of those same patients had CTCs.

Although it is more technically difficult to collect blood from an artery than a vein, this and other research suggests that checking arterial blood may be a more accurate way of assessing circulating tumor number, and therefore metastatic disease.

More information: M. Terai et al., "Arterial Blood, Rather Than Venous Blood, is a Better Source for Circulating Melanoma Cells," *EBioMedicine*, DOI: [10.1016/j.ebiom.2015.09.019](https://doi.org/10.1016/j.ebiom.2015.09.019), 2015. www.sciencedirect.com/science/.../S2352396415301389

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