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Korea develops handheld device to diagnose cancer without radiation

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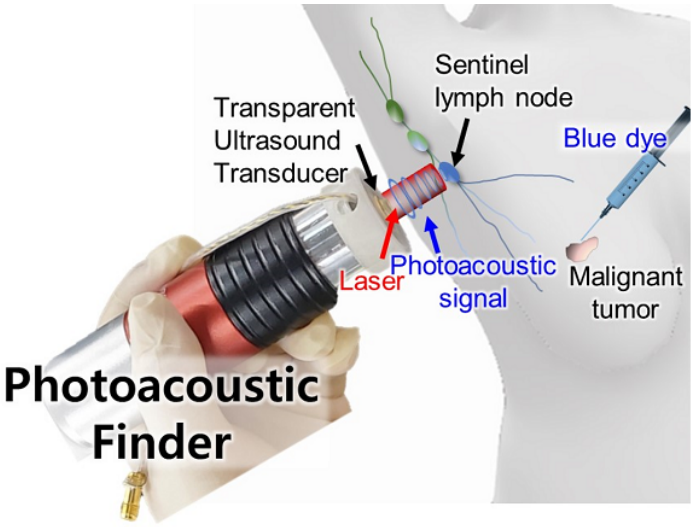
Develops a photoacoustic signal detector equipped with a transparent ultrasound transducer and a solid-state dye laser



A team of scientists at the Pohang University of Science and Technology (POSTECH) in South Korea has developed a handheld photoacoustic finder that can help examine lymph node conditions without radiation exposure.

Cancers such as breast cancer and melanoma metastasize primarily through lymphatic system, so knowing the condition of the lymph nodes is essential in accessing the stage and prognosis of cancer.

The handheld photoacoustic finder (PAF) is equipped with a solid-state dye laser and a transparent ultrasound transducer (TUT). Unlike conventional gamma probes, this non-radioactive PAF eliminates the risk of exposure to radiation and the need for special facilities and allows repeated usage which is cost-effective.

In general, a sentinel lymph node (SLN) biopsy around the cancer is performed to assess the metastasis in breast cancers and melanoma. This is because the SLN is the first gateway for tumors to travel to the lymph nodes. However, since conventional biopsies use radioisotopes to find the SLN, patients and physicians are inevitably exposed to radiation and the procedure requires a special facility to access radioactive materials.

Using the photoacoustic finder, the researchers successfully located the SLN in the underarm of a mouse placed under a chicken breast after injecting blue dye into the mouse. The photoacoustic finder (PAF) system is the first portable photoacoustic sensing tool for SNL localization. This research shows great potential to be helpful in detecting SLN or melanoma without using radioactive substances in the future.