

Basic technology for a high-sensitivity photo-acoustic imaging contrast agent

To contribute to the early detection and treatment of cancer

【Achievement】

Hitachi, Ltd. today announced the development of basic technology for a contrast agent to be used with high-sensitivity photo-acoustic imaging, a medical imaging technique suited for the detection of minute tumor growths deep within the body. This contrast agent uses nano-droplets which repeatedly change to a gaseous state and generate ultrasound pulses when irradiated by a light source. In comparison to conventional contrast agents, a high ultrasound signal representing almost a tripling of sensitivity was confirmed. Further, it was found that measurement of tumors deep within the body could be achieved with high resolution, something which had hitherto been difficult with conventional contrast agents.

■ Characteristics

- (1) Development of basic technology for a photo-acoustic imaging contrast agent using nano-droplet technology

The formation of a light-absorbing layer was added to the nano-droplet technology developed in 2006, to develop a nano-droplet that changes to a gaseous state and generates sound waves when irradiated by light.

- (2) Development of a nano-droplet structure that would repeatedly vaporize with irradiation

With conventional contrast agents, an ultrasound signal is generated only once when the agent changes to a gaseous state. By optimizing the composition and the particle size, a nano-droplet structure was developed which repeatedly generated sound waves on irradiation.

■ Plan

This technology is expected to contribute to the early detection and treatment of cancer.