

I.5 Position determine system for Lymph node relating breast cancer using a High Tc SQUID

Oral
Saturday 10:30 *S. Tanaka[†], H. Ota and S. Uchida, Ecological Engineering, Toyohashi University of Technology, 1-1 Hibarigaoka Tempaku-cho Toyohashi Aichi 441-8580, Japan; Y. Tamaki and S. Noguchi, Department of Surgical Oncology, Biomedical Research Center Osaka university Graduate School of Medicine, 2-2-E10 Yamadaoka, Suita, Osaka 565-0871, Japan*

The performance of a lymph node detection system used with an ultra-small superparamagnetic iron oxide and a high-Tc SQUID was investigated. This system is applicable for sentinel lymph node biopsy which is a newly developed surgical technology. The sentinel node biopsy is a kind of examination to investigate whether the sentinel node, which initially receives malignant cells from a breast carcinoma is disease-free or not. If the sentinel node is free of disease, you can leave the rest of the lymph-nodes because of no concern for progression. Conventionally, a radio isotope was used to identify the sentinel lymph node. We propose the use of radio exposure-safe ultra small iron oxide particles such as a magnetic resonance imaging (MRI) contrast agent. The ultra-small iron oxide particles of 360 picograms in weight of iron dispersed in a solution could be detected with a spacing of 1mm. When a spherical pseudo lymph node was used with spacing of 20 mm, the detectable weight of the particles was 40 micrograms. The resolutions are good enough to apply the technology for a sentinel-node biopsy and a lymphatic mapping. The use of the lock-in-amplifier is a crucial point to obtain a good resolution in the system.

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[†]E-mail: tanakas@eco.tut.ac.jp