accurately coregistered PET MTV with CT images when stand-alone PET systems are used for RTP in lung cancer.

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Effect of Superparamagnetic Iron Oxide Labeling on Immunological Characteristics of Macrophage-like THP-1 Cells

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Superparamagnetic Iron Oxide (SPIO)-transfection agent complex are being used to label different mammalian cells. Labeled cells can then be used as an *in vivo* magnetic resonance imaging (MRI) probes. However, certain number of *in vivo* administered labeled cells may be cleared from the tissues by host macrophages. For successful clinical application of SPIO labeling method it is important that this mode of *in vivo* clearance of iron does not elicit any diverse immunological effects. The purpose of this study was to demonstrate that FePro incorporation into macrophages does not alter immunological properties of these cells. We used THP-1 cell line as a model for studying macrophage cell type. THP-1 cells were magnetically labeled with ferumoxides-protamine sulfate complexes (FePro), differentiated with 100nM of TPA for 24h and stimulated with 100 ng/ml of LPS for 30 minutes or 4 hours. After 30 min of LPS stimulation, cytoplasmic and nuclear protein fractions were analyzed by immunobloting for the activation of NfKB/IkB cell signaling pathway. For hours after incubation with LPS, cells were analyzed for the expression of HLA-DR, CD117, CD54, CD11b and CD83 cell surface proteins while the cell supernatants were analyzed by ELISA for TNF-α production. Flow cytometric analysis revealed no differences between FePro labeled and non-labeled THP-1 cells in the levels of TPA- induced upregulation of cell surface markers. In addition, FePro labeling did not affect the ability of THP-1 cells to respond to LPS with activation of NfKB/IkB pathway and a subsequent release of TNF-α. Ferumoxides-protamine sulfate complex does not alter the immunological properties of THP-1 cells. It is possible that this method can be used in various clinical settings without causing any adverse effects that may stem from immunological reaction to the iron clearance by host's macrophages.

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Development and Diagnostic of approach using an Electron Tracking Compton Gamma-Ray Camera

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A Compton gamma-ray camera can measure multi energy gamma rays at the same time in the wide energy dynamic range (200 - 2000keV). Furthermore, it is not necessary to surround the living body because the Compton gamma-ray camera can get information of the depth with a measurement from one direction. The camera has a larger field of view (3str) than a detector size because a collimator does not need. A Compton gamma-ray camera which we develop can catch a track of a recoil electron which is not caught with a conventional Compton gamma-ray camera. A recoil electron is detectable by a gasuaes position detector. We performed system evaluation using a point source with sealed radioactive source Na-22(511keV) and achieved position resolution of 23mm (FWHM). We have contructed use of being a portable camera system and experimented on non-sealed radioactive source I-131(365keV) in Keio University hospital. We achieved spatial resolution 27mm (FWHM) in a point source of I-131. Also we performed a thyroid gland phantom experiment (I-131, 3MBq, 24 hours). We performed system evaluation using FDG (511keV) in Kyoto University RI center. In addition, we administered FDG and I-131 (7MBq, 5 hours) to a rat at the same time and succeeded in imaging. This result showed possibility of multi-modality of PET/SPECT. In addition, in late years imaging of a characteristic of a plant have been significant with PET rapidly. We administered Mn-54 (835keV) to a plant and succeeded in imaging. We present about a performance of Compton camera using the phantoms, small animals, and plants in this symposium.

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