

S41-2 Application of multiple molecular imaging for non-invasive bioimaging of metals

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Bio-metals are essential for living organisms. However, the accumulation of an excessive trace element into the living body causes toxicity though is an essential trace element. On the other hand, the disappearance of an excessive trace element from the living body causes the deficiency.

For studying the toxicometallomics, it is important to develop new technology, such as the detection of chemical speciation in the living organism and imaging method. Multiple molecular imaging, which allows simultaneous visualization of the molecular dynamics in various biological processes, is required to achieve more advanced and precise diagnosis. To realize the multiple molecular imaging, we have developed a Compton camera composed of two Ge semiconductor detectors, which we call GREI (Gamma-Ray Emission Imaging). Owing to the outstanding energy resolution of Ge detector, the GREI enables to distinguish the multiple radionuclides by emitted gamma-ray energies (200 keV ~ 2 MeV). Using the GREI, the in vivo distributions of the multiple molecules can be visualized simultaneously by labeling with different radioactive nucleotides. In this symposium, we would like to introduce the GREI system, which is a powerful tool for studying the toxicometallomics.