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# Absolute Bioluminescence Imaging of Tumor Tissue

Yoshihiro Ohmiya\*<sup>†1</sup>, Ke-Yong Wang , Chun Wu , Hidehiro Kubota , and Hidefumi Akiyama

<sup>1</sup>National Institute of Advanced Industrial Science and Technology (AIST) – 1-1-1 Higashi, Tsukuba, Ibaraki 305-8561, Japan

## Abstract

Bioluminescence imaging (BLI) reveals the gene expression at the single cell or the tumorization of tissue as a light signal using a highly sensitive cooled CCD camera. However, the signal of BLI is a relative value and therefore, we cannot compare directly several images taken in different day or different equipment. Here, we established the reference LED light source which is known the characteristic of total flux and light distribution, and calibrated the BLI system as an absolute light signal. In this presentation, we proposed quantitative detection method of tumor tissue based on a reference standard LED and antibody-fused bioluminescent protein. Especially, this system in immunohistochemistry can translate a relative light unit to number of protein via absolute photon number. The sensitivity of our bioluminescent labeling was atto-Watt level, resulted in we detected ca.  $1 \times 10^5$  number of antigen level. We demonstrated 3D-imaging following serial section in colon tumor tissue standardized by the number of target antigen. Our novel technique can easily compare the immune histological images in different section, different tissue and different day sample.

**Keywords:** Bioluminescent probe, imaging, antibody

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\*Speaker

<sup>†</sup>Corresponding author: