New ***B****ioluminescent* ***I****maging* ***S****ubstrate*

Oct, 2024

AkaSuke™

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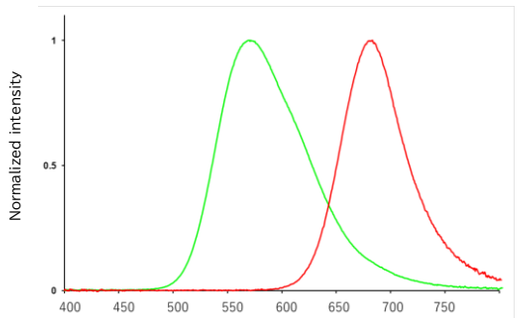
PAT : JP7255828B, US11807612B2, CN115996914B

AkaSuke is a highly brightness luminescent substrate well-suited for *in vivo* bioluminescence imaging (BLI). Compared to wild-type luciferin (D-luciferin), AkaSuke, having ca.680nm of the bioluminescence maximum wavelength (within near-infrared region), shows higher permeability for bio-tissue because of reducing absorption by hemoglobin. AkaSuke enables a highly sensitive BLI at deep bio-tissue.

The Characteristics

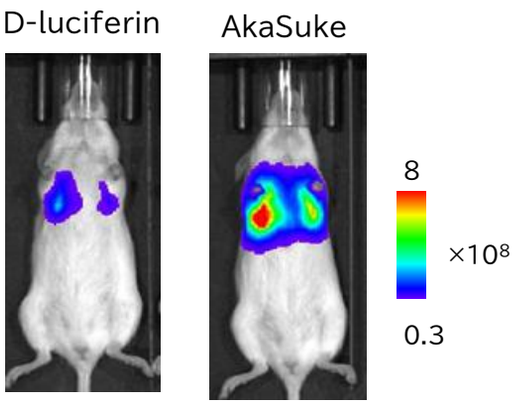
- ✓ Colored Solid
- ✓ Near-infrared emission (680 nm)
- ✓ High water solubility
- ✓ High brightness reacted with Fluc

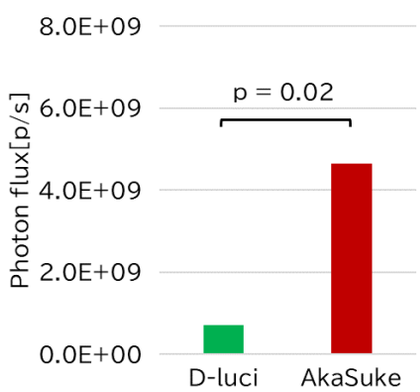


Detection device: ATTO AB-1850 spectrometer, exposure time: 3 min, substrate: 5 μL (100 μM in 50 mM KPB at pH6) Enzyme (Ppy Luc); 5 μL (1 mg/mL in 35% glycerin 50 mM KPB, pH8), Buffer; KPB 500 mM, pH8 5 μL, Mg-ATP; 200 μM in H_2O 10 μL

Data Provided: Assistant Prof. Moriya, Tokyo Pharmaceutical Univ. (currently Assistant Prof. of Japan Women's University)

Comparison of bioluminescence imaging



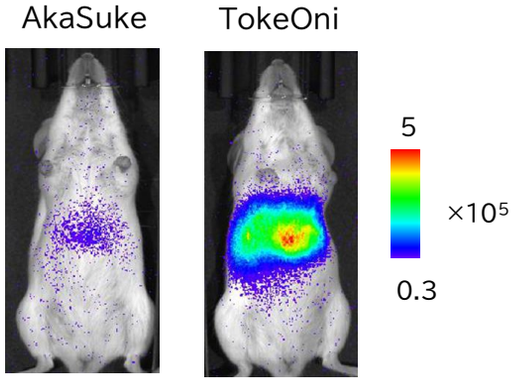


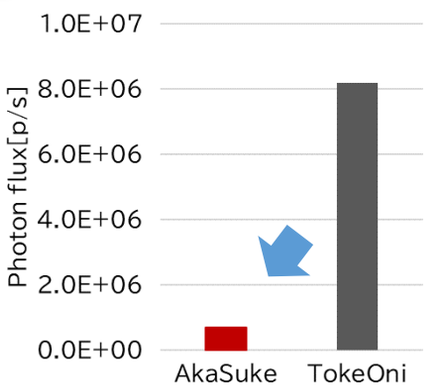
AkaSuke achieves to detect approximately **6 times stronger** luminescence signals from deep tissue compared to D-luciferin.

Data provided: Assoc. Prof. Kuchimaru. Jichi Medical Univ.

Luminescence imaging of a lung metastasis model in mice: Results of quantitative analysis of luminescence intensity from metastatic lesions.
The substrate was administered to a lung metastasis model mouse (E0771/Fluc, day 13), and the luminescence generated from metastatic lesions was measured. Following the administration of D-luciferin (10 μmol per mouse, intraperitoneal injection), AkaSuke (3 μmol per mouse, intraperitoneal injection) was administered 6 h later. (n = 3)

Liver autoluminescence





Significant reduction in liver autoluminescece
(Model mice do not express luciferase)

Data provided: Assoc. Prof. Kuchimaru. Jichi Medical Univ.

The substrate was administered (3 μmol per mouse, intraperitoneal injection) to B6 albino female mice (8 weeks old), and the luminescence emitted from the liver was measured 6 minutes after administration.

※1 Assoc. Prof. H. Aoyama, Faculty of Pharmaceutical Sciences, Tokyo Pharmaceutical Univ.; Assistant Prof. R Moriya (currently Assistant Prof., Japan Women's Univ.); Assistant Prof. R. Ijuin (at the time). This collaboration stems from research conducted jointly with Prof. S. Maki from the Graduate School of Information Science and Technology, and Project Assistant Prof. N. Kitada from the Research Equipment Center at the University of Electro-Communications.

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