

Bioluminescence Imaging Reagents

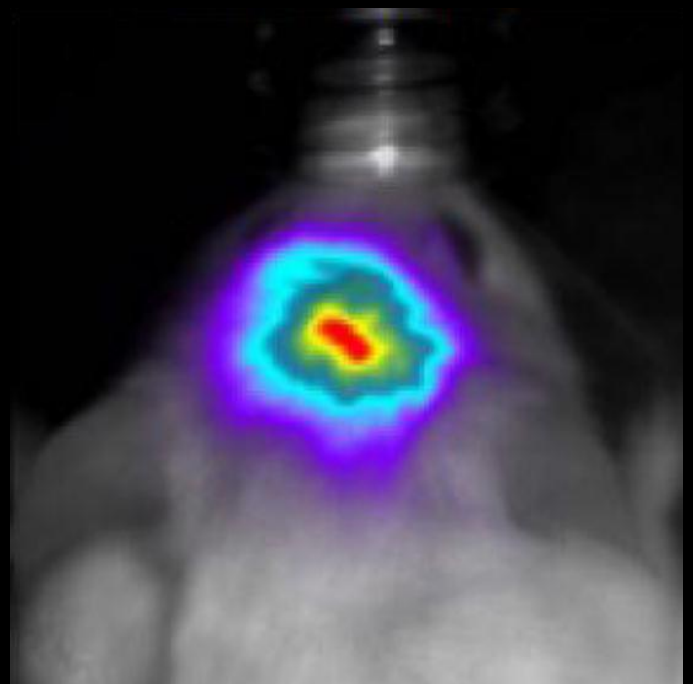
Deep brain imaging of live tissue

AkaLumine-HCl

**D-luciferin
Fluc**



**AkaLumine-HCl
Akaluc**



Dr. Iwano and Dr. Miyawaki et al. developed AkaBLI that is a new bioluminescence in vivo imaging system. AkaBLI produced emissions in vivo that were brighter by a factor of 100 to 1000 than conventional systems. AkaBLI is expected to find out unprecedented scientific, medical, and industrial applications.

Data provided by Dr. Satoshi Iwano and Dr. Atsushi Miyawaki,
Laboratory for Cell Function Dynamics, Brain Science Institute, RIKEN

General description

AkaLumine-HCl is a luciferin analog has the luminescence peak at 670 ~ 680 nm . The peak range is in the near-infrared (NIR) window (also known as optical window). Since the adsorption of hemoglobin and water is small in the optical window, Aka Lumine is well suited to in vivo imaging.

1. Features

- Near-infrared red (NIR)-emission luciferin analog
- Peak luminescence at 675 nm.
- Allows non-invasive visualization of single cells deep inside freely moving animals.
- Orally bioavailable and brain penetrant.

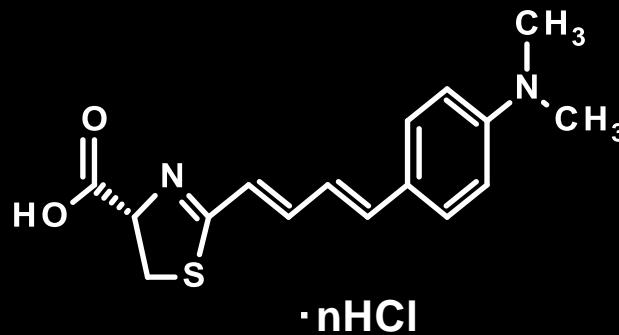


Fig1. AkaLumine-HCl

2. Luminescence Wavelength

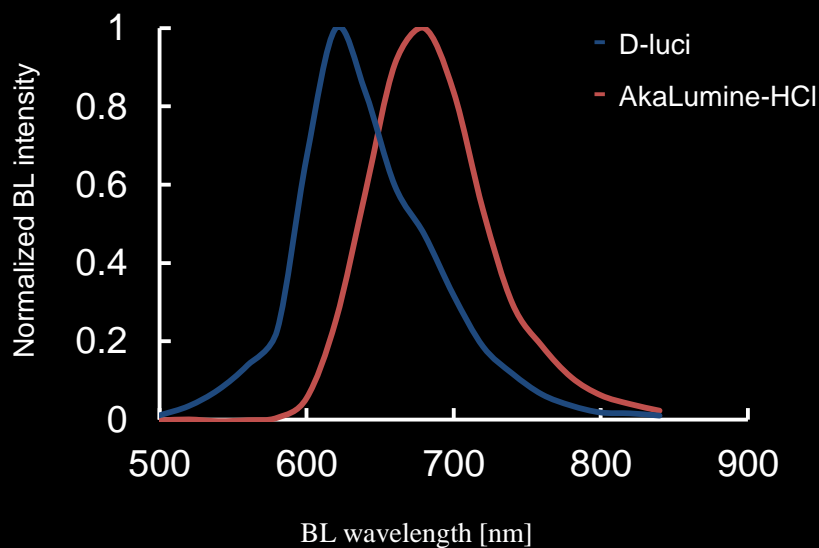


Fig2. Bioluminescence emission spectra of D-luciferin (D-luci) and AkaLumine-HCl (Aka-HCl).

Applications using AkaLumine -HCl

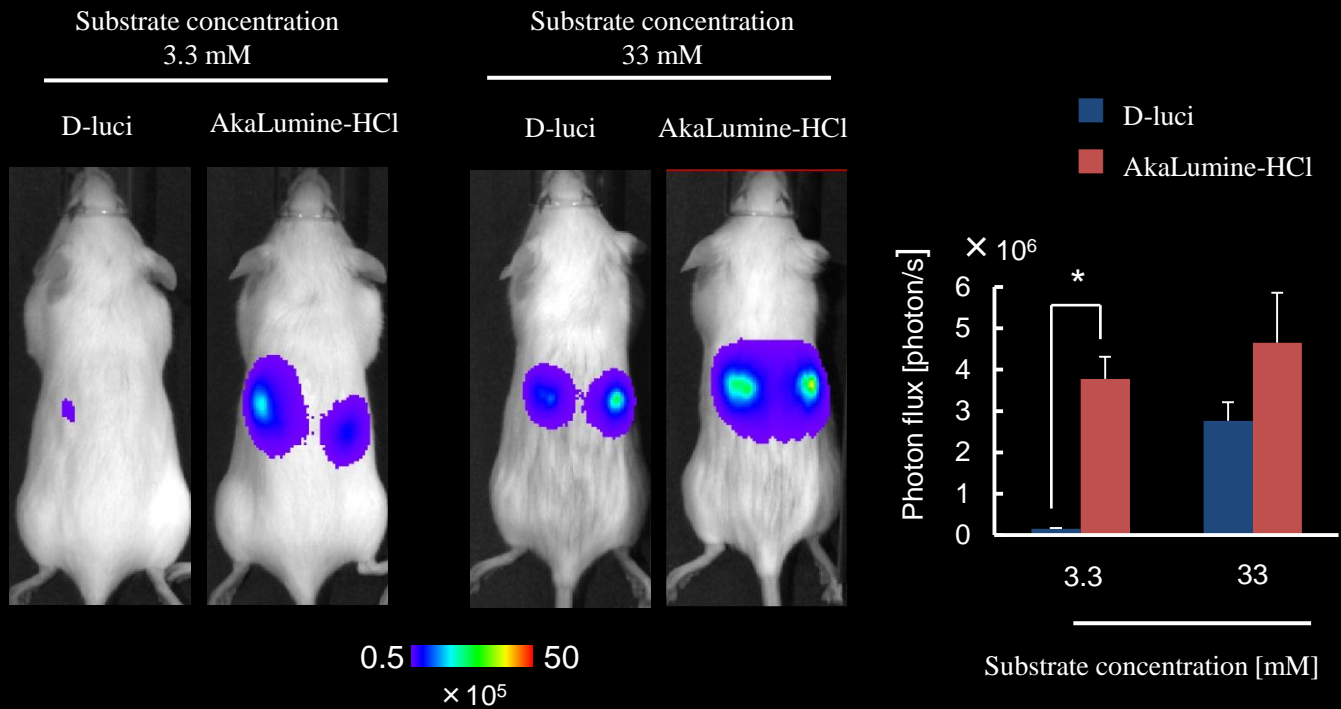


Fig3. Representative BL images of LLC/luc subcutaneous tumours and quantitative analysis of BL production 15 min after intraperitoneal injection of 100 μ l of D-luciferin (D-luci) or AkaLumine-HCl (Aka-HCl) with indicated concentration. $n=4$ * $P<0.05$ (t -test). The substrates were injected to the same mouse in the order of D-luci and Aka-HCl at a 4-h interval. Error bars indicate s.e.m.

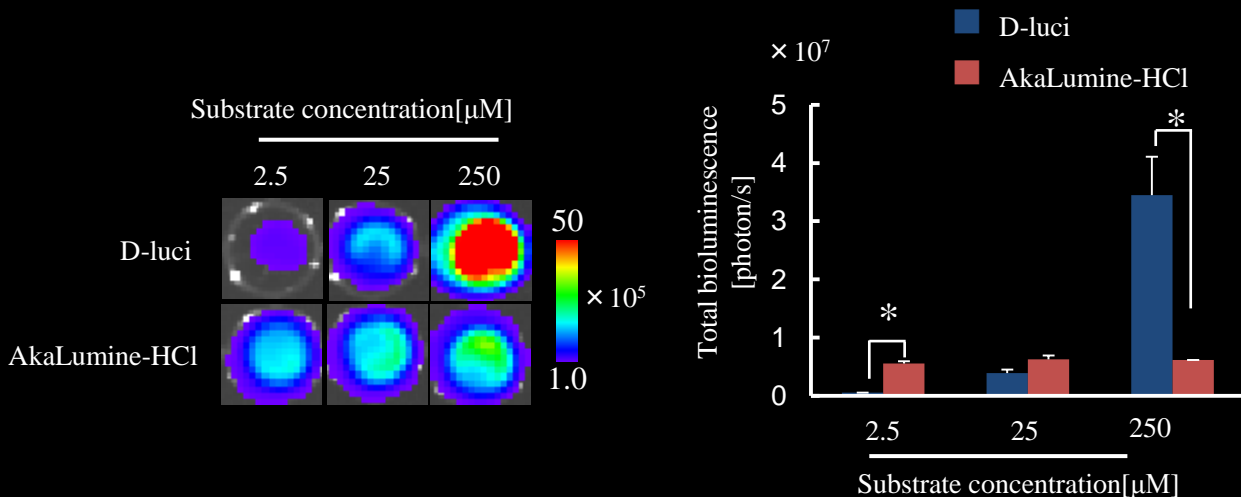


Fig.4 Substrate dose dependency of total production in LLC/luc cells. The cells (4×10^5 cells per well) were treated with the substrate at indicated concentrations. Images were acquired with 680 ± 10 nm emission without a filter, to measure total bioluminescence signals, respectively. $n=3$, * $P<0.05$ (t -test). Error bars indicate s.e.m.

A

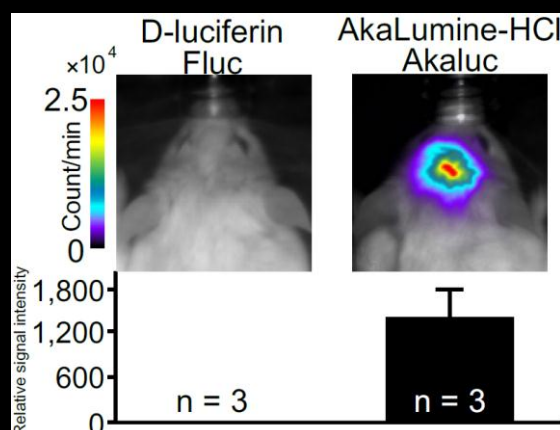


Fig5. Bioluminescence images using AkaBLI system

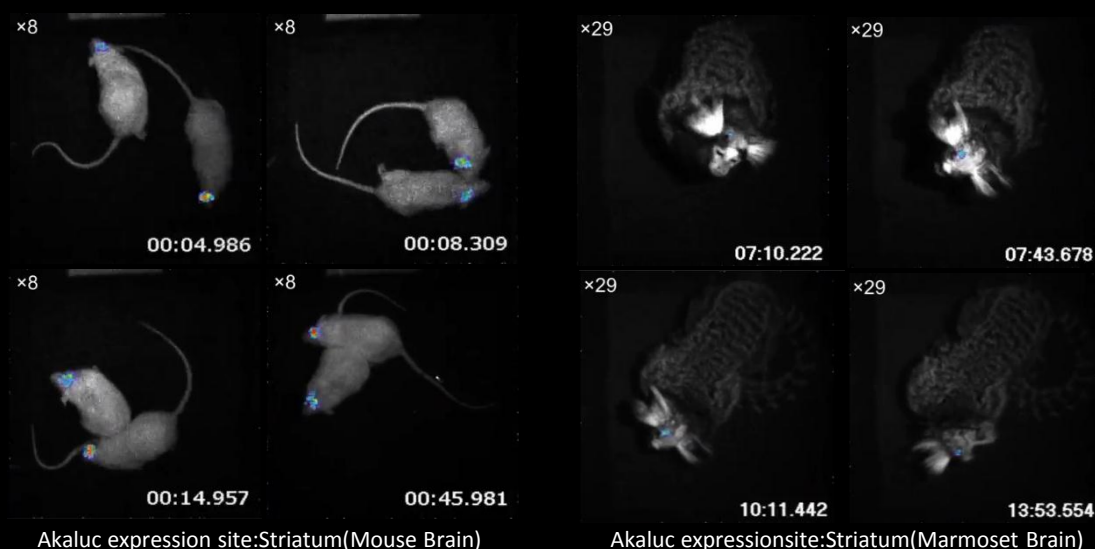
(A) Bioluminescence images

Bioluminescence images of mice 2 weeks after viral infection for expression of Fluc (left) and Akaluc (right) in the right striatum. Immediately after substrate administration (intraperitoneal), anesthetized mice were imaged using a cooled CCD camera (top). The AkaLumine-HCl/Akaluc signals were statistically compared to D-luciferin/Fluc signals (middle). Data are presented as mean \pm SEM of n = 3 mice. Mice were injected with 100 to 200 μ l of D-luciferin (100 mM) or AkaLumine-HCl (30 mM).

(B) *In vivo* bioluminescence imaging

An example of bioluminescence imaging of Akaluc expression in the striatum of two freely moving rats and the marmoset.

B



【References】

- 1) Iwano, S. *et al.*: *Tetrahedron.*, **69**, 3847(2013).
- 2) Kuchimaru, T. *et al.*: *Nature Communications.*, **7**, 11856 (2016)
- 3) Iwano, S. *et al.*: *Science.*, **359**, 935(2018).

Product name	Wako cat. No.	Package Size	Storage	Grade
AkaLumine -HCl	012-26701 018-26703	1mg 10mg	-80°C	Biochemistry

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