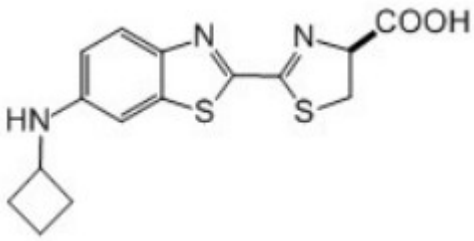
FT-AXBRCA

CybLuc

Product Description

Name :	**CybLuc**
Catalog Number :	AXBRCA, 5 mg AXBRCB, 10 mg
Structure :	C15H15N3O2S2
Molecular Weight :	333,42
Properties:	**Solubility: 10mM in DPBS**



Storage: –20°C

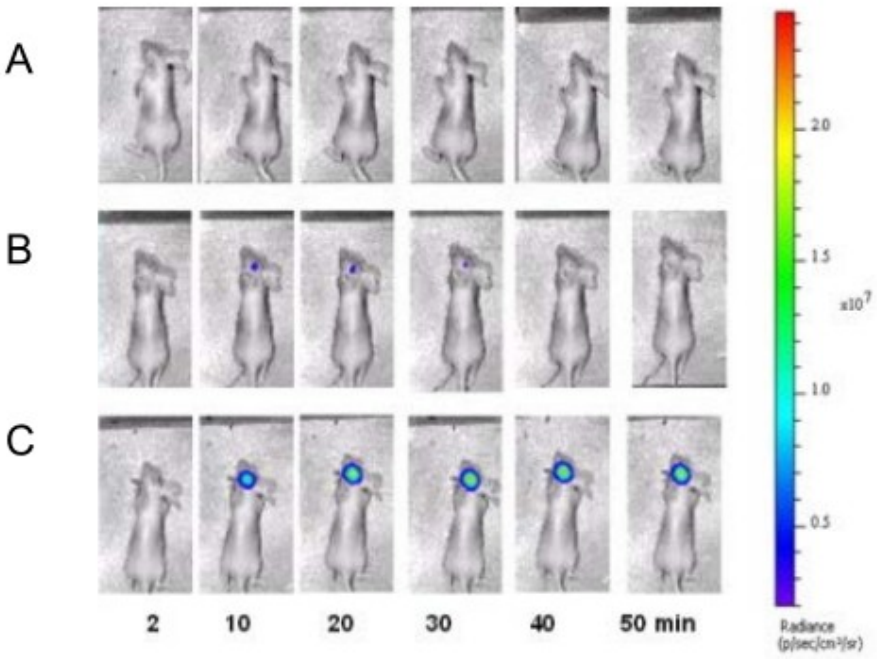
Introduction

In vivo imaging is one of the most promising areas of development of Luciferin-Luciferase bioluminescence (1–3). The group of Prof. Minyong Li recently developed CybLuc, a novel Luciferin derivative with longer signal duration and significant bathochromic (red) shift (λ max = 603 nm).

Application

Firefly luciferase bioluminescence is a powerful investigative tool for the understanding of fundamental biological and physiological questions (i.e. for studying tumor growth and inhibition).

Fig. 1: Brain tumor tissue imaging in mouse model, comparison between (A) DLuc, (B) aLuc and (C) CybLuc (#AXBRCA).



CybLuc is particularly suitable for in vivo imaging, requiring low substrate loading: only 0.01 % of the typical dosage of native Luciferin (dLuc) is sufficient.

The half-life of CybLuc is superior to another red-shifted luciferin derivative, amino luciferin (aLuc), allowing longer circulation time in vivo. In addition, the increased lipophilicity of the compound allows better passage of the blood-brain barrier, which is particularly important for brain tissue imaging (Fig.1).

Advantages of CybLuc at a glance:

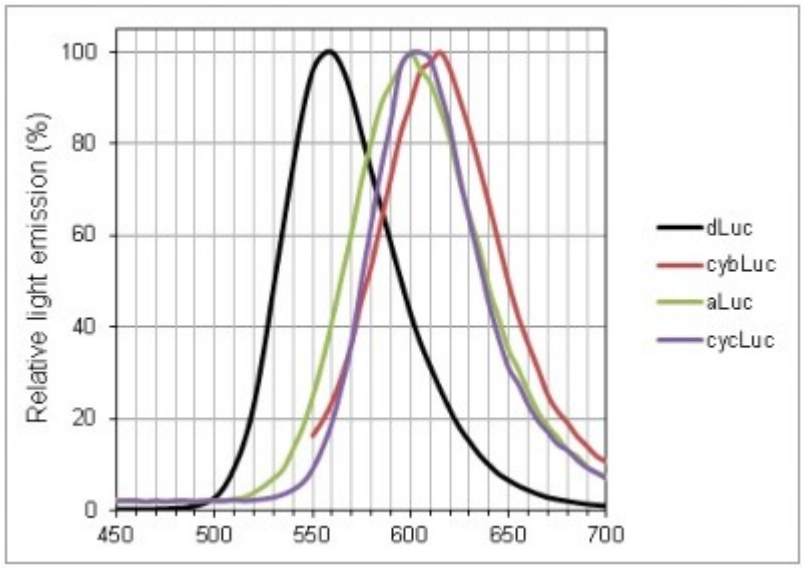
o Red-shift of light emission improves signal penetration depth in vivo

o 20-fold higher bioluminescence signal than D-Luciferin in vivo

o Stable luminescence signal for 1 hour (detectable as long as 12 hours) in vivo

Technical information

Light emission properties of CybLuc, CycLuc (a commercially available modified amino-luciferin), aLuc and dLuc:



Bathochromic effect of dLuc and aLuc derivatives. Comparison of bathochromic effect of the four Luciferins when exposed to Photinus pyralis luciferase: all three Luc derivatives have significant red-shift compared to native D-Luciferin (dLuc), in particular CybLuc shows an even slightly higher maximum wavelength shift.

Directions for use

The intensity of light emission was also tested in the following conditions: Tris HCl 50 mM with 10 mM MgCl 2 and 0.1 mM ZnCl 2 , 1 mM ATP, pH 7.4, 10 µg/mL recombinant P. pyralis luciferase, 1 µM luciferines, showing that the emission intensity of CybLuc is in the same order of magnitude as CycLuc and significantly stronger than aLuc.

A. CybLuc for in vitro bioluminescent assays

Prepare aqueous solutions in ultrapure water (e.g. Milli-Q water).
(1.) Prepare a fresh 200X CybLuc stock solution (4 mM): Dissolve 1.3 mg/mL CybLuc in ultrapure water. Mix gently until CybLuc is completely dissolved.

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(2.) Prepare freshly the CybLuc working solution: dilute 200X CybLuc solution 1:200 in pre-warmed cell culture medium or normal saline (NS) to give 20 µM final concentration. e.g. to prepare 5 mL of substrate solution, dilute 25µL of 200X CybLuc stock solution in 5 mL of medium or NS.
(3.) Aspirate media from cultured cells.
(4.) Add an appropriate volume of CybLuc working solution to cells or tissue culture. e.g. on 96-well plates use 50 µL per well
(5.) Measure the bioluminescence immediately after the addition of the substrate with an acquisition time of 1 or 20 s. It is recommended to use a recording system that is equipped with a cooled CCD camera for bioluminescent imaging at 37°C.

B. CybLuc for in vivo bioluminescent assays

Prepare all aqueous solutions in ultrapure water (e.g. Milli-Q water).
(1.) To prepare a fresh 10 mM CybLuc solution dissolve 3.3 mg CybLuc (C-8790) in 1mL DPBS (Dulbecco's phosphate-buffered saline, without Magnesium and Calcium) or in NS (normal saline).
Mix gently by inversion until CybLuc is completely dissolved. Filter sterilize through a 0.2 µm filter.
(2.) Inject 10 µL of the 10 mM CybLuc Solution per gram of body weight. For example, inject intra-peritoneal (i.p.) 100µL for a 10 g mouse.
(3.) Bioluminescence images can be acquired 10 minutes after i.p. injection* with 1 second acquisition time.

* For signal optimization, CybLuc kinetic studies should be performed for each animal model to determine the peak signal time.

References

1. Prescher J.A.; Steinhardt R.C.; Paley M.A.; McCutcheon D.C. J. Am. Chem. Soc. 2012, 134 (18), 7604-7607.
2. Miller S.C.; Prescher J.A.; Aronin N.; Paley M.A.; Reddy G.R. ; Adams Jr. S.T.; Chaurette J.P.; Evans M. S. Nat. Methods 2014, 11, 393-395.
3. Miller C.; Adams S.T. Jr.; Curr. Opin. Chem. Biol. 2014, 0, 112-120.
4. Wu W.; Su J.; TangC.; Xaixiu B. ; Ma Z. ; Zhang T. ; Yuan Z. ; Li Z. ; Zou W. ; Zhang H.; Liu Z.; Wang Y.; Zhou.; Du L.; Gu l.; Li M. Anal. Chem., 2017, 89 ,4808–4816.

Ordering information

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