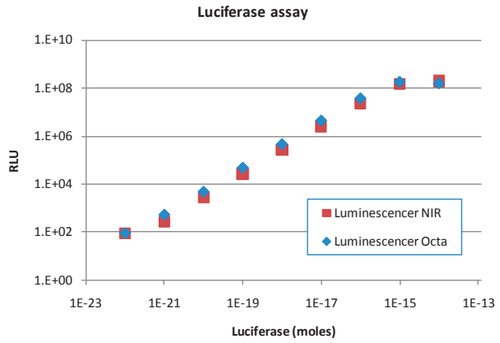
Superior performance of Luminescencer NIR for ordinary work as a luminometer

Luminescencer NIR developed as a NIR detection system is not limited for using only dedicated studies with NIR probes, it gives superior performance for ordinary studies such as ATP assay, luciferase assay.

The result of luciferase assay demonstrated that the detection sensitivity of Luminescencer NIR is quite high (refer to the right graph).It is available to detect at least 1 zmoles (10^{-21}moles) of luciferase molecules using Luminescencer NIR. Furthermore Luminescencer NIR can measure the wide range concentration of samples quantitatively with 8 logs of linear dynamic range.

Luminescencer NIR is a novel device to detect the wide wavelength range extend to near-infrared light with retaining wide dynamic range in high sensitive detection as a conventional luminometer "luminescencer Octa".



Model	AB-2280 Luminescencer NIR
Sample format	φ12×55 mm tubes／1.5 mL microcentrifuge tubes
Detector	Photomultiplier (PMT) Photon counting methods
Spectral range	350～900 nm
Filters	F0: no filter, F1: 560nm LP, F2: 600nm LP
Color separation	Up to three luminescence colors can be separated with automatic filter change mechanism
Injectors	Built-in plunger type (25~300 μL) 25 μL steps
Printer	Built-in thermal printer 24 digits
Temperature control (Optional equipment)	Ambient＋5 ℃～40℃
Data saving	200 files of measurement results, 9 files of calibration curve Exporting and data saving to PC through Windows interface program
Size	250(W)×310(D)×176(H) mm
Weight	7.5 kg
Power	AC 100-120 or 200-240 V, 50/60Hz, 50 VA

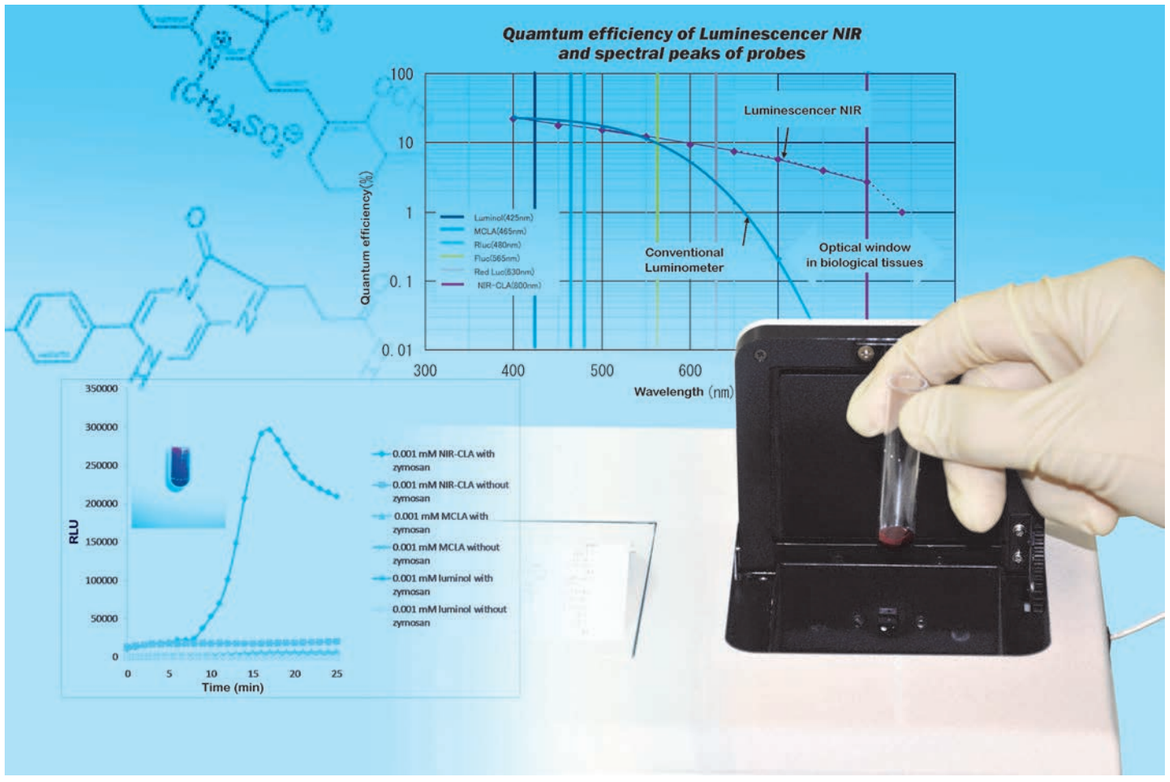
	AB-2980 NIR-CLA (Near-infrared probe for active oxygen detection)
Substance	Indocyanine Imidazopyrazinone compound
Molecular weight	1156 Dalton
Wavelength	800 nm
Amount	0.1 mg (powder)
Storage	−80℃

Luminometer for detection of near-infrared light

AB-2280 Luminescencer NIR

Near-infrared for active oxygen detection

AB-2980 NIR-CLA



ATTO Corporation

3-2-2 Moto-asakusa, Taito-ku, Tokyo 111-0041, JAPAN
Tel: +81-3-5827-4863 Fax: +81-3-5827-6647
e-mail: eig@atto.co.jp
URL: http://www.atto.co.jp/eng/index.html

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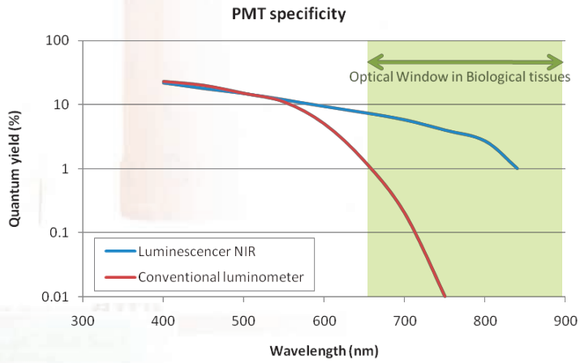
Luminescencer NIR

Introduction

Luminescencer NIR is the new type of single tube luminometer in photon counting method for measurement of wide wavelength range between 400 -900nm. It has been improved to measure more wide wavelength range which covers near-infrared light (NIR) accurately retaining the high sensitivity and wide dynamic range of conventional luminometer.

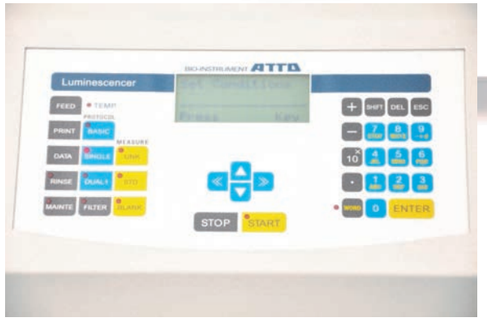
Luminescencer NIR can measure target molecules better than conventional luminometers since Near-infrared light can penetrate biological tissues such as skin and blood more efficiently. Besides, bioluminescent reagents used ordinary can be measured in same level of precision and sensitivity same as conventional luminometer.



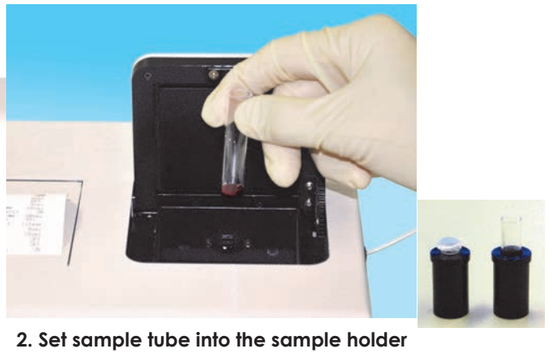
Features

- Detector covered for wide wavelength range between 400-900nm
  →Applicable of bioluminescence & chemiluminescence probes with 650～950nm wavelength which can penetrate the biological substances (e.g. blood, skin, tissues).
- Wide dynamic range (8 logs)
- High sensitivity
  →Detection limit is 1zmol(10^{-21}moles) of luciferase molecules
- Temperature control system (Room temprature +5°C to 40°C)
  →Temperature control for appropriate condition to measure living cell and tissue samples
- Auto injector system
  →Programmable injector condition which enable to detect flash-based luminescence.
- Color separation system
  →Tricolor of luminescence can be separated and analyzed automatically with filter system (560LP, 600LP).

Simple & Easy



1. Set up the measurement condition with control panel (numeric keys).



2. Set sample tube into the sample holder
Accommodation of test tube (12 x 55mm) & 1.5 mL microcentrifuge tube

3. Set the reagent for injection
It does not required to prepare a plenty volume of the reagent. About 600 µL of the reagent is sufficient for rinse or prime.

4. Start the measurement
The measurement data and kinetics curve are printed out automatically. It is also easy to export the data to PC through USB interface.

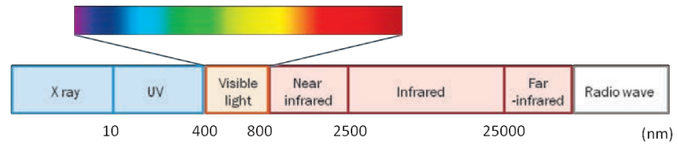
Near−infrared probe NIR-CLA

What is the near-infrared light?

Simply hold your hand in sunlight and your fingers will glow red owing to the preferential transmission of infrared and near-infrared light.

Near-infrared light is in wavelength between 700-2500nm, and is hardly affected by scattering and absorption in biological tissues such as skin and blood.

Near-infrared light can penetrate biological tissues, so that it can be used for infrared data communication, surveillance camera, thermograph system and more.



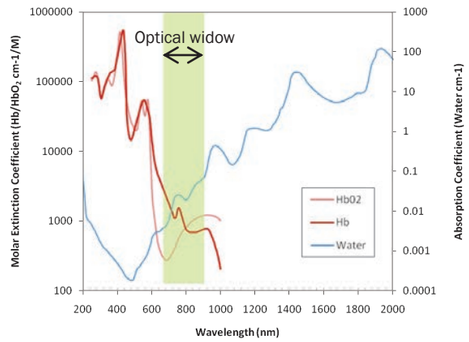
The optical window of Bio-spectrum – the light between 650-950nm –

Since near infrared light does not interact with substances, it can penetrate the substances such as blood and biological tissues.

Although near-infrared light is easily to penetrate body tissues, this effect diminishes at wavelengths longer than 950 nm owing to increased absorption by water and lipids.

Meanwhile, the absorption spectrum of hemoglobin in blood becomes easier to penetrate, as it diminishes at wavelengths beyond 650nm.

Therefore the light between 650nm-950nm is called [The optical window of Bio-spectrum] since this range of wavelengths can penetrate living organisms easily without interruptions of biomolecules.

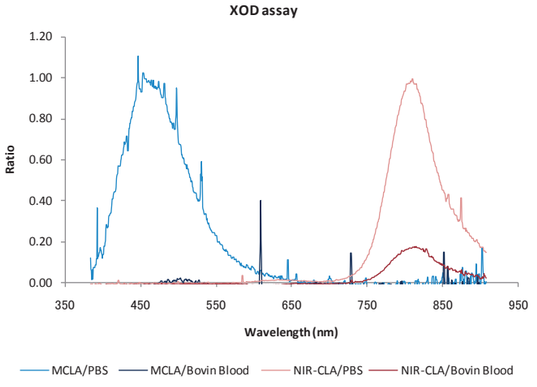


NIR-CLA probe enables to measure active oxygen in whole blood sample

The novel probe for detection of active oxygen is emitted near-infrared light of 800nm by reaction with super-oxygen.

Since hemoglobin absorbs the light below 650nm, other probes such as [MCLA] or [Luminol] which has a peak in under 500nm can not be detected their signals in blood sample.

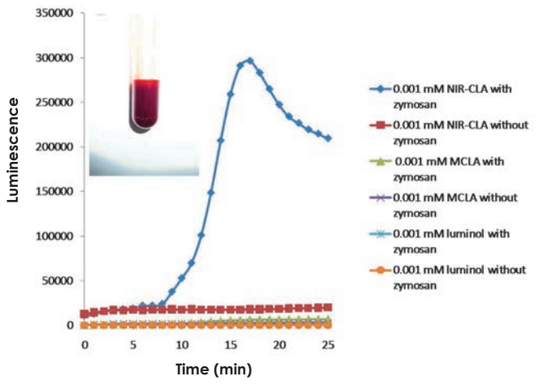
NIR-CLA probe enables to detect super-oxygen in whole blood sample very efficiently. The signal of NIR-CLA probe in blood sample is transmitted about 20% of that in PBS, although it is affected from absorption by hemoglobin.



Comparison between MCLA and NIR-CLA probe's spectra in blood

Comparison of transmittance ability and spectrum between MCLA and NIR-CLA are shown.

The graph indicates that NIR-CLA (shown as red line) signal in blood sample was successfully transmitted about 20% of that in PBS, while MCLA (shown as blue line) in blood sample had no signal by absorption.



Monitoring of active oxygen in human blood

It detected amount of O^{2-} generated by stimulation with zymozan against human blood sample in using NIR-CLA, MCLA and Luminol.

After the stimulation with zymozan, only NIR-CLA was available to observe generation amount of O^{2-} in time course.

Data Supported: Dr. K. Teranishi, Graduaate school of Bioresources, Mie University, JAPAN