

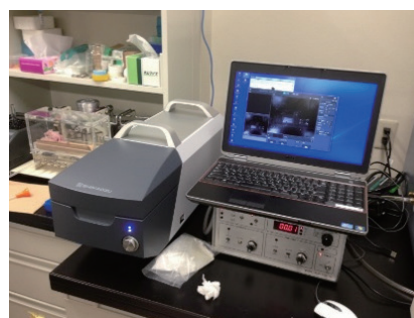
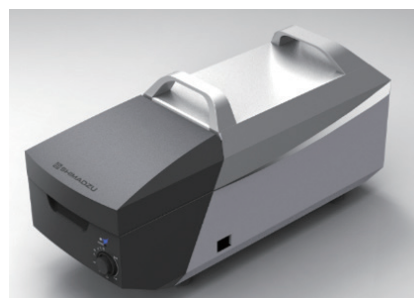
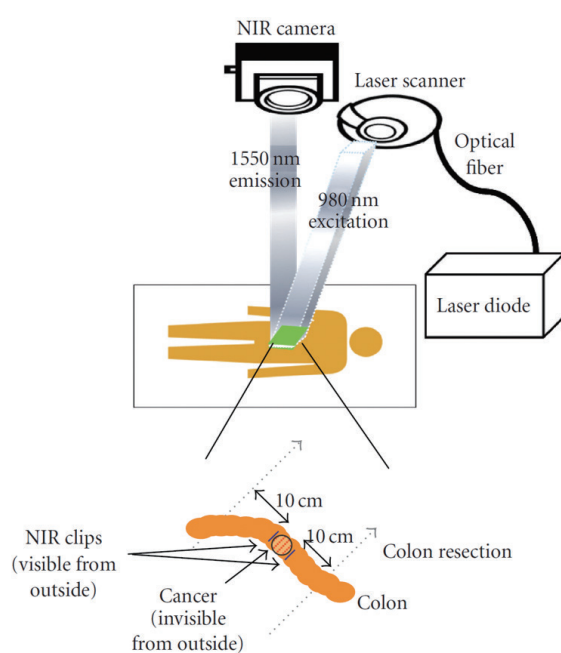
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Purpose of Research

Fluorescent imaging is one of the most important basic technologies in fields of biology and medicine. Visible or near-infrared light with a short wavelength, either of which is currently used, has limitations in observation depth and clearness due to strong light scattering and autofluorescence. Meanwhile, the 1000-nm or more near-infrared light (OTN-NIR) is expected to provide the observation depth of several centimeters, compared favorably with conventional depth of several millimeters. However, the wavelength region 1,000 nm or more cannot be observed because a silicon CCD camera can only capture the images with a wavelength less than 1000 nm.

Summary of Research

This technology achieves to realize OTN-NIR fluorescence in-vivo bioimaging, in so-called “the second biological window” by developing an imaging system equipped with InGaAs CCD camera and a diode laser excitation and rare earth-containing ceramics nanoparticles (RED-CNP) as fluorescent probes at the same time.



Portable OPT
(jointly developed with Shimadzu Corporation)

Comparison with Conventional or Competitive Technology

- Bioimaging in OTN-NIR
- Enable measurement insensitive to light scattering and autofluorescence
- Imaging with several cm depth

Expected Applications

- Imaging for small animals
- Imaging for diagnosis and medical care
- DDS kinetic analysis in the pharmaceutical field

Challenges in Implementation

- The imaging device for small animal research has been already developed with Shimadzu Corporation and launched onto the market.
- We will do the projects on 1) implementing the imaging device for diagnosis and medical care, and 2) developing various kinds of the fluorescent probes.

What We Expect from Companies

We are finding the company as a collaborative project partner, who is willing to develop the imaging device for diagnosis and medical care, the novel fluorescent probes, and 3D imaging technology utilizing the depth imaging.

Points

- Capable of imaging deep part of a living body
- Capable of highly-accurate measurement without effecting cell or vital environment
- Capable of real-time measurement or long-time measurement

Research Schedule

December 2014: Launch the imaging device for small animal onto the market (Shimadzu Corporation)

April 2017: Produce a prototype of the imaging device for diagnosis and medical care

April 2022: Start the clinical applications & Launch the imaging device for diagnosis and medical care onto the market

December 2027: Launch the imaging device for diagnosis and medical care onto the market

- Awards:
JSDMD Symposium, “Best Lecture Awards” (April 11, 2009)
Japanese Bioimaging Society, “Best Image OLYMPUS Awards” (November 2, 2006)
- Intellectual Property:
Japanese Patent 6617978 “Optical Imaging Device”
- Prototype: Present
- Sample: Available