



# 9<sup>th</sup> RAP Seminar

The 9th Seminar on RIKEN Center for Advanced Photonics

Language: Japanese

Date : Feb.14 (Fri), 2014, 16:00 ~ 17:00

Location : Cooperation Center, 3F, W319, Wako Campus, RIKEN  
(理研 和光キャンパス 研究交流棟3階会議室 W319)

Title : **In vivo, in vitro and ex vivo imaging  
based on bioluminescence systems**

多様な生物発光で見る生命現象

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In the postgenome era, reporter systems are used widely to study promoters, interactions between promoters and transcription factors, signal transduction, and other cellular activities. Reporter enzymes are also applied to drug screening both in vitro, in cellulo and in vivo. Of the reporter genes known to date, luciferases, enzymes that catalyze bioluminescence reactions, are used most frequently because their sensitivity and linear response range are superior to those of typical reporters. Bioluminescence is a simple reaction that is triggered by the addition of luciferin solution, and the equipment for measuring light intensity is simple because it uses only a photomultiplier or a charge-coupled device camera; thus, this system can be applied to high-throughput screening. So, luciferases are the most suitable reporter enzymes for the quantitative measurement of gene expression. Furthermore, bioluminescence imaging has played an important role in molecular imaging from single cell to small animals. However, we must consider the principle and the characteristics of bioluminescence reactions and select a suitable bioluminescence system depending on the purpose or target. In this seminar, I introduce the basic and application of bioluminescence.