



Department of Biotechnology
Ministry of Science and Technology
Government of India

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National Institute of
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SILVER Jubilee SERIES – BEING light up with BIOLUMINESCENCE !!!!

DAILAB-CAFE

Series - 025

Date & Time: December 18, 2017 (4:00 to 5:00 p.m. JST)

Venue: Central 5-41; 2F (Conference Room # 1)

Speaker: Yoshihiro OHMIYA

Title: **Blessed with Bioluminescence: Firefly, Click Beetle and Railroad Worm Acts**

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Abstract: In the entire world, there are many kinds of bioluminescent livings, including several kinds of bioluminescent beetles; firefly, railroad-worms, click-beetles. For firefly, there are about 2,000 species in the world, and about 40 species in Japan alone. In biological standpoint, firefly is a good indicator of environmental change and evolutionary relationship [1,2]. In chemistry viewpoint, bioluminescence is a simple chemical reaction, where luciferin is oxidized by oxygen, converted to excited oxyluciferin and finally emits a light catalyzed by luciferase enzyme [3-5]. Until ten years ago, many researchers believed this reaction occurs with a highest efficiency; one chemical reaction produce one photon. However, based on the research in Japan (including my team), it is currently established that this reaction has only a moderate efficiency (quantum yield=0.41) [6]. In bioengineering, beetle luciferase serves as a good enzymatic reporter assay for gene expression analysis, imaging and several other applications [7,8]. I have been studying the basic biology of bioluminescence of luminescent beetles, and developing several useful applications for last quarter of a century. In this seminar, I will share my experiences with bioluminescent beetles, the amazingly beautiful players of bioluminescence !

Further readings-

[1] Ohmiya et al. *Photochem. Photobiol.*, 62: 309-, 1995

[2] Li et al. *Gene* 392: 196-, 2007

[3] Ohmiya et al. *FEBS Lett.* 384: 83-, 1996

[4] Viviani et al. , *Biochemistry* 38: 8271-, 1999

[5] Niwa et al. *FEBS Lett.* 580: 5283-, 2006

[6] Ando et al. *Nature Photonics* 2: 44-, 2008

[7] Yeom et al. *Proc. Natl. Acad. Sci. USA.* 107: 9665-, 2010

[8] Ohmiya *Com.I Chemistry & High Through. Screening* 18: 937-, 2015