



48th RAP Seminar

The 48th Seminar on RIKEN Center for Advanced Photonics

Language: Japanese

Date: **Dec.15 (Fri) 16:00 - 17:00, 2017**

Location: **W319, 3F, Cooperation Center, Wako Campus, RIKEN**

(理研 和光キャンパス 研究交流棟 3階会議室 W319)

Title: **Neural activity manipulation and behavior control by using fiber-less optogenetics**

ファイバーレス光遺伝学を用いた神経活動操作と行動制御

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Optogenetics enables us to control specific type of neurons by illuminating light. It becomes popular technique in the neuroscience research field. However, rhodopsins, such as channelrhodopsin and halorhodopsin, are activated by visible light which has low tissue penetration. To deliver, visible light to deep area of tissue, it is essential to insert fiber optics. This caused tissue invasion and behavior restriction. Recently we developed fiber less optogenetics by using up-conversion response of lanthanide. Lanthanide micro particles were implanted into tissue and near infra red (NIR) light which has higher tissue penetration was illuminated from out side of body. NIR was converted to visible light by up-conversion response to control neural activity. In this seminar I will introduce principle and application of fiber-less optogenetics using lanthanide up-conversion response.