

13th RAP Seminar

The 13th Seminar on RIKEN Center for Advanced Photonics

Language: Japanese

Date : June 20(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: **PET molecular imaging for medical innovation**

分子イメージングの活用による医療イノベーション

Speaker : **Dr. Yasuyoshi WATANABE**
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In vivo molecular imaging has become a key technology for medical innovation, *i.e.*, integrated live science, patho-physiological science, molecular evidence-based diagnosis, innovative drug development, and preemptive medicine. Rapid progress in life science brought the stage up to the living objects or subjects, even functioning human beings. The invention of a variety of imaging techniques including Positron Emission Tomography (PET) accelerated the paradigm shift in life science from patho-physiological science in disease model animals to that realized in patients. Especially, the molecular imaging techniques could promote the bridging between findings in gene-manipulated animals and those in healthy volunteers and patients. When the biomarkers for early detection of signs toward diseases and also those for surrogate end-point were established and their changes could be followed by molecular imaging, it could be quite beneficial for preemptive medicine and evaluation of therapeutic outcome. For example, beta-amyloid imaging and pancreatic beta-cell mass imaging have been highlighted for prediction of Alzheimer's disease and diabetes mellitus, respectively. Such types of valuable biomarkers related to the cause or influencing factors are also really important to develop the new drugs. In this sense, mutual collaboration among the research consortia in biomarker exploration, in gene manipulation, and in molecular imaging would be really important. In this context, our Center in RIKEN is acting as the key hub center of the Molecular Imaging Research Program under MEXT, for development of All-Japan research network to further promote mutual international and multi-disciplinary collaboration on *in vivo* molecular imaging. To realize the molecular probing concept, we have so far developed a variety of novel chemical methods for labelling the low and higher molecular weight compounds with due positron emitters, such as C-11, F-18, Ga-68, and Cu-64, and the number of different types of the molecular probes to be used in PET study is more than 245 so far developed in our Center and the repertoire being increasing every day. Direct application of this molecular probing concept is to pharmacokinetics and efficient DDS development. The concept, outline of our activities, PK/PD studies, and preemptive medicine studies with efficient application of molecular imaging will be presented.



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