36th RAP Seminar

The 36th Seminar on RIKEN Center for Advanced Photonics

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(**理研 和光キャンパス 研究交流棟3階会議室** W319)

Title: **The life of the autophagosome: Formation and maturation**

オートファゴソームの一生：形成と成熟機構

Speaker: **Prof. Noboru MIZUSHIMA**

(Graduate School of Medicine, The University of Tokyo)

水島　昇

（東京大学大学院医学系研究科　教授）

Autophagy is a major degradation system in the cell. Intracellular components are sequestered by autophagosomes and then degraded upon fusion with lysosomes. Yeast genetic studies have identified more than 40 autophagy-related (*ATG*) genes. Many of these genes are conserved in higher eukaryotes and are essential for autophagosome formation. We have also investigated the maturation step of the autophagosome and identified the autophagosomal SNARE, syntaxin 17 (STX17). STX17 interacts with the HOPS tethering complex, SNAP29, and VAMP7/8, and is required for the fusion between autophagosome and lysosomes. Of note, STX17 is absent in the forming isolation membrane (unclosed autophagosome), which could explain why autophagosomes can fuse with lysosomes only after completion of autophagosome sealing. Soon after recruitment of STX17, the autophagosome fuses with several small lysosomes. Acidification initially occurs only between the outer and inner autophagosomal membranes, followed by entire acidification due to degradation of the inner membrane. Using STX17 as a new marker of the autophagosome, we re-examined the function of Atg proteins and revealed a novel role of Atg proteins also in the maturation step. I will also present a novel autophagy probe, which we can use to monitor the autophagic flux in cells and whole organisms.

Contact: rap-seminar_contact@riken.jp (ext.8532)　　連絡先：光量子工学研究領域 セミナー担当 (内線8532)