

DATE: Day 22 Month April Year 2017

**SUMMARY of**  
**2016 RESEARCH RESULTS REPORT**  
**For International Collaborative Research with IPR, Osaka University**

<b>Research Title</b>		<b>Crystal Structure of RavZ, LC3-deconjugating enzyme</b>
<b>Applicant</b>	<b>Name</b>	<b>Hyun Kyu Song</b>
	<b>Affiliation</b>	<b>Division of Life Sciences, Korea University, Korea</b>
	<b>Present Title</b>	<b>Crystal structure of RavZ from <i>Legionella pneumophila</i></b>
<b>Research Collaborator (Host PI)</b>		<b>Atsushi Nakagawa</b>

**Summary**

The research proposal was study on the full-length RavZ, an associated molecule with autophagy marker protein LC3B. *Legionella pneumophila* can hinder host cell autophagy by using the specific effector protein RavZ that cleaves phosphatidylethanolamine (PE)-conjugated LC3 on the phagophore membrane. We determined crystal structures of RavZ showing different conformations of the active site loop without LC3. The structure of RavZ is markedly different from that of ATG4B, which shares a functional similarity. To obtain detail information of action mechanism of this cysteine protease, we focused on RavZ complex structures with various substrates (LC3 protein as well as different peptides). Because of continuous failure to obtain complex crystals between RavZ and LC3 (or its C-terminal peptide), We performed the biochemical characteristics of the RavZ-LC3 interaction, and identified three LIR (LC3-interacting region) motifs in RavZ. They locates both flexible N- and C-terminal regions of RavZ and are critical for substrate recognition. Interestingly, there are two tandem LIR motifs at N-terminal region, but only one LC3 can interact with the N-terminal region of RavZ. These results suggest a novel mechanism of RavZ action on the phagophore membrane and lay the groundwork for understanding how bacterial pathogens can survive autophagy.

**\*Deadline: May 19, 2017**

**\*Please submit it to E-mail: tanpakuken-kyoten@office.osaka-u.ac.jp.**

**\*We accept only PDF file. Please file it after converting WORD to PDF.**

**\*Please describe this summary within 1 sheet. Please DON'T add some sheets.**

**\*This summary will be published on the web.**