

DATE: Day 15 Month 6 Year 2017

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

<b>Research Title</b>		<b>Development and applications of solid-state NMR techniques to study the structure and dynamics of biosolids</b>
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	<b>Present Title</b>	<b>Professor</b>
<b>Research Collaborator (Host PI)</b>		<b>Toshimichi Fujiwara</b>
<b>Summary</b>		
<p>Solid-state NMR provides structural information of biological systems in unoriented solids such as biological membranes and fibers which are not amenable to X-ray crystallography owing to difficulties in forming well-ordered crystals. However, applicability of the NMR to biologically important macromolecular complexes is primarily limited by the sensitivity of NMR. Therefore, we apply recent technologies, high-field dynamic nuclear polarization (DNP) and high-speed magic angle spinning, to the sensitivity enhancement of solid-state NMR available at Institute for Protein Research, Osaka University. We have performed several variable temperature high-speed MAS experiments on a membrane protein embedded in vesicles, DNP based MAS experiments on a membrane protein embedded in vesicles, variable temperature MAS experiments on bone and bone-related materials, and DNP based MAS experiments on bone and bone-related materials. We have obtained several promising results for these subjects although they are still preliminary. After these optimization of experimental conditions such as temperature, polarizer concentration, lipid-protein ration and hydration level, we can obtain NMR parameters for structure and dynamics of membrane protein and bone which cannot be acquired by other methods.</p>		

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

**\*Please submit it to E-mail: [tanpakuken-kyoten@office.osaka-u.ac.jp](mailto:tanpakuken-kyoten@office.osaka-u.ac.jp).**

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