

2008A採択長期利用課題の中間評価結果について

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2008A期に長期利用課題として採択となった2件の課題について中間評価を実施しました。中間評価は、実施開始から1年半が経過した課題について、実験責任者からの事前の提出書類および口頭での成果報告を受け、長期利用分科会で3年目の実施判断を行うものです。以下に対象課題の評価結果と実験責任者による成果リストを示します。

1. SPIN polarized high resolution HArD X-ray Photo Emission Spectroscopy (SPINHXPES)

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| 実験責任者名 (所属) | Claudia Felser (Johannes Gutenberg-University, Mainz) |
| 採択時の課題番号 | 2008A0017 |
| ビームライン | BL47XU |
| 評価結果 | 3年目を実施する |

[評価コメント]

The aim of this proposal is to develop spin polarized high-resolution hard x-ray photoemission spectroscopy (SPINHXAPES), which can play an important role in the fields of science and technology. The original plan contained two experimental developments as the main work: installation of a phase retarder and development of a new multi channel spin detector. The phase retarder has been successfully installed in the beamline and several MCD data from core level photoelectron spectra have been already obtained. The plan for the spin detector has been changed due to difficulties during transportation of the detector from Europe to SPring-8, but now a new detector is in SPring-8 and measurements using it is scheduled in 2009B. The group has also found that a usage of a thin film increases the photoelectron intensity and therefore may compensate the extremely low intensity throughput of a spin detector. Expecting that the group can obtain new data providing deep insight into the spin resolved electronic structure of magnetic

materials and spintronics devices using these techniques, the review committee concludes that it is appropriate to give another year for this long-term project. On the other hand, the review committee strongly requests to the group for publishing papers within the period of this long-term project.

[成果リスト]

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- [4] G. Stryganyuk, S. Ouardi, X. Kozina, A. Gloskovskii, G. H. Fecher, C. Felser, M. Hahn, G. Schönhense, M. Yamamoto, K. Inomata, E. Ikenaga and K. Kobayashi, Spin-resolved HAXPES technique for the investigation of new spintronic materials, DPG Spring Meeting 2009, Technische Universität Dresden, Dresden March 22-27, Germany.
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- [6] G. H. Fecher, C. Felser and K. Kobayashi, Detection of the Valance Band in Buried $\text{Co}_2\text{MnSi-MgO}$ Tunnel Junctions by Means of Hard X-Ray Photoemission Spectroscopy, SPring-8 Research Frontiers 2008,

Reprint 2009, 86.

2 . Structure Study of Regulated Intramembrane Proteolysis

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| 採択時の課題番号 | 2008A0019 |
| チームライン | BL41XU、BL38B1 |
| 評価結果 | 3年目を実施する |

〔評価コメント〕

It is notable that the structures of several important membrane proteins have been obtained since this project started. These are all challenging studies and the scientific level is outstanding. The papers are all published in journals with high impact factors. This demonstrates the ability of the researchers to carry out high-level science. On the other hand, the relationship between these scientific achievements and the purpose of the proposed project is not clear.

The study on S2P published in PNAS has a large scientific impact and is considered to be central to this proposal. However, it is rather disappointing that only the structure of the cytoplasmic domain of S2P has been solved. Although this may not have been the case in this particular study, a cytoplasmic domain is generally easier to crystallize than the entire membrane protein and thus its scientific impact is lower. The goal of this project should be crystallization and structural determination of the entire S2P molecule. This will reveal how the cytoplasmic domain PDZ2 affects the catalytic domain and facilitate understanding the mechanism of regulated intramembrane proteolysis.

Since the regulated intramembrane proteolysis is of great biological significance, we recommend continuation of the study following the plan in the original proposal for another year. We look forward to structural determination of S2P and SPP.

〔成果リスト〕

- [1] Xiang Gao, Lijun Zhou, Xuyao Jiao, Feiran Lu, Chuangye Yan, Xin Zeng, Jiawei Wang and Yigong Shi. (2009) Structural Basis of Substrate Recognition and Transport by the Amino Acid Antiporter AdiC. *Nature (AIP)*.
- [2] Yi Wang, Yongjian Huang, Jiawei Wang, Chao Cheng, Weijiao Huang, Peilong Lu, Ya-Nan Xu,

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- [7] Xu Zhang, Jiawei Wang, Chao Fan, Husheng Li, Honghong Sun, Shunyou Gong, Youhai Chen and Yigong Shi. (2009) Crystal structure of TIPE2 provides insights into immune homeostasis. *Nature Structural & Molecular Biology* 16: 89-90 [Epub: Dec 14, 2008].