

平成 26 年 3 月 31 日

(独) 理化学研究所
研究担当理事 川合 眞紀

平成 25 年度実施 主任研究員の間接レビューの結果について

主任研究員制度設置規程(平成 25 年規程第 13 号)第 5 条に基づき主任研究員の間接レビューを踏まえ、レビューアーから送られた評価結果は以下のとおりです

1. 評価対象：佐甲細胞情報研究室 佐甲 靖志 主任研究員

1) 評価体制

実施日：平成 26 年 1 月 9 日 (木曜日)

4 名の所外有識者を評価委員とするヒアリングレビューを実施

評価者：

Masamitsu IINO, Professor

Graduate School of Medicine, The University of Tokyo

Shinya KURODA, Professor

Graduate School of Science, The University of Tokyo

Michiyuki MATSUDA, Professor

Graduate School of Biostudies, Kyoto University

Derek TOOMRE, Associate Professor

Yale University School of Medicine

2) 評価結果の概要等

General comments: (arranged in random order)

【Reviewer 1】

Dr. Sako is one of the leading scientists in the field of single molecule imaging with fluorescent dyes. His laboratory focuses on the analyses of the molecules comprising the growth signal transduction cascade of mammalian cells. Although there are a number of researchers who study the signaling pathways of growth factors or oncogene products, but very few are challenging to visualize the dynamics of single molecules. Therefore, the observation reported from Sako laboratory often became the biophysical basis to interpret biochemical and/or biological observations by other groups. Recently, Sako laboratory has started collaboration with researchers having mathematical basis. This is a reasonable approach and indeed has started to produce fruitful collaborative results. Five staff scientists work with Dr. Sako. These five researchers have their strength in different research area, which enables Sako laboratory to challenge many question in depth. In summary, Cellular Informatics Laboratory holds a unique and outstanding feature in the field of signal transduction research. The solid basis of their research is being evaluated highly by many researchers in this field.

【Reviewer 2】

The goal of Sako's lab is to elucidate the mechanism of signal transduction and information processing in cell-fate decision in terms of cell-to-cell deviation by mainly using single molecule imaging technique. It is remarkable that Sako's lab has succeeded in finding important features at each step of signaling pathways from receptors to ERK. He also challenged the mechanism of the final output in cell-fate decisions in terms of cell deviation. They also discovered an asymmetric association of PAR2 along the long axis of embryo. These findings are novel and very unique. I believe that Sako's lab is one of the pioneering and the most competitive labs in this field. The PI organizes the lab very efficiently and interdisciplinary. The future plan is attractive and promising.

【Reviewer 3】

The major scientific objective of the 'Cellular Informatics Laboratory', led by Chief Scientist Dr. Sako, is to elucidate the mechanisms of signal transduction of pathways critical to cell responsiveness and fate. A main component, and unique strength of the lab, is on elucidating transient intermediate states of signaling molecules so as to kinetically model and better understand these critical pathways. This important area is extremely technically challenging, as it requires imaging of single molecules in vivo and highly sophisticated analysis. To undertake it the Sako laboratory has implemented state-of-the-art single molecule imaging (SMI) and a gamut of new analytic and statistical methods (these alone have resulted in numerous papers). Their toolkit is world class and in combination with clever experiments have allowed them to map the intermediate states of key growth factor receptor pathways (e.g. ErbB-RAS-MAPK), which are the target of many anti-cancer drugs. The group has been a world leader in studies of single molecular signaling, which has shown a number of striking findings, including how single molecules can function in noisy environments and how specific molecular states can prime downstream reactions. Their work at RIKEN is both novel and prolific, with over 30 papers that fundamentally affect the signaling field. The Sako laboratory and its resources are very well managed and have a strong positive impact, exemplified by numerous collaborations and the development of a leading highly qualified team. The future program is ambitious, and elements that extend the recent SMI studies to G-protein coupled receptors and continue to technically advance SMI methodology are very likely to be successful and should have a major impact. In summary, the Cellular Informatics Laboratory has made major scientific advances and is expected to remain leaders in this exciting and rapidly advancing field.

【Reviewer 4】

Dr Sako is an expert in the field of single molecular analysis. Using state-of-the-art imaging and analysis methods, the Sako group has successfully gained quantitative insights into the complex molecular mechanism of ErbB receptor signaling, which is involved in cell fate decision. The research group has expanded the scope of the research field to single cellular analyses, utilizing the

Raman spectroscopic imaging technique. The research group has been engaged in collaboration with numerous research groups outside RIKEN, and has obtained sizable amount of external research funds. Intimate relationship among the laboratory members has been created. Overall the research group led by Dr Sako is a world leader in the field of single molecular analysis. It is expected that the group continues to excel in this research field extending the scope of their study into the molecular understanding of dysregulated cellular functions.

以上