Form 3

Report for Joint/Usage Research Program for Endocrine/Metabolism (Fiscal Year 2017)

Date: 2018/4/27

To Director of Institute for Molecular and Cellular Regulation, Gunma University

Principal Applicant	
Institution	Department of Molecular, Cell & Developmental Biology, University of California, Los Angeles
Position	Associate Professor
Name	Atsushi Nakano

We report on the results of joint research in fiscal 2017 as below.

(Program No. 17010)

1. Research Title	Quantitative evaluation of cardiac mitophagy in diabetic animal models
2. Purpose and Significance of the research project	Maintaining mitochondria homeostasis is a key to normal heart function. The targeted removal of damaged mitochondria occurs via mitophagy. The establishment of mitophagy reporter mice has greatly facilitated the quantitative assessment of mitophagy in vivo. The objective of our study is to assess the status of cardiac mitophagy in diabetic model mice and to test the hypothesis that a sodium-glucose cotransporter 2 (SGLT2) inhibitor can restore heart function in these mice by normalizing cardiac mitophagy.
3. Period of The Program	April 1, 2017 ～ March 31, 2018

4. Project Members

Name	Age	Gender	Institution/Department	Position	Role
(Principal Applicant) Atsushi Nakano	48	M	Department of Molecular, Cell & Developmental Biology, University of California, Los Angeles	Associate Professor	Project director
(Research Collaborators) Haruko Nakano	48	F	Department of Molecular, Cell & Developmental Biology, University of California, Los Angeles	Associate Research	*In vivo* analysis

※If additional space is required, attach a separate sheet.

5. Collaborative Researcher of IMCR	Name of the Laboratory	Developmental Biology & Metabolism	Name	Yoshio Fujitani

6. Research Plans

The collaboration between the two laboratories includes the following key experiments.

[1] Establishment of mouse models of diabetes and analysis of their metabolism (Y. Fujitani, Gunma Univ.).

[2] Quantitative evaluation of cardiac mitophagy by crossing the diabetic mice with mitophagy reporter mice (A. Nakano and H Nakano, UCLA)

[3] Assessment of the cardiac function of diabetic mice by echocardiography and histological analysis (A. Nakano).

7. Research results:

The principal researcher (Dr. A. Nakano) visited IMCR [from June 28 to July 4, 2017] to have an intense discussion with Dr. Fujitani on the collaboration, particularly on the assessment of heart failure in diabetic mice.

Streptozotocin-induced diabetic animal models on B6 background have been established in Gunma University and the experimental procedures will be replicated in UCLA.

The mitophagy reporter mice were characterized and it was found that active mitophagy is ongoing in the tissue of cardiac muscle, kidney and exocrine pancreas. In the next trial, alteration of mitophagy status will be investigated in the presence or absence of hyperglycemia.

8. Publications and/or Presentations resulting from Joint Research Program with IMCR.

①Please describe a list of publications in which the name of the collaborative researcher of IMCR appears and send one paper reprints of each publication to IMCR.

②Please describe a list of publications which include the description that the research is supported by Joint Research Program with IMCR and send one copy of each publication to IMCR.