Form 3

Report for Joint/usage program for Endocrine/Metabolism

Date: 2016/03/06

To:

Director of Institute for Molecular and Cellular Regulation

- 1. Program No. 14023
- 2. Research title: Postprandial lipoprotein metabolism by lipoprotein lipase and hepatic lipase
- 3. Objective of the research: Analysis of the distribution of lipoprotein lipase and hepatic lipase in remnant lipoprotein fraction and their contents in post- and pre-heparin plasma samples collected at UC Davis by Peter Havel.
- Name of Principal Researcher: Peter Havel Position/Affiliation: Professor, Department of Molecular Biosciences, School of Veterinary Medicine and Department of Nutrition University of California Davis

Name of Co-applicant: Kimber Stanhope Position/Affiliation: Research Director/ Department of Molecular Biosciences, School of Veterinary Medicine and Department of Nutrition University of California Davis

Name of Co-applicant: Katsuyuki Nakajima Position/Affiliation: Visiting professor, Department of Clinical Laboratory Medicine, Gunma University Graduate School of Medicine

Name of Researcher in charge in IMCR: Fumikazu Okajima Position: Professor

- 5. Period: From 2015/04/01 to 2016/3/31
- 6. Research plans:

Analysis of the distribution of lipoprotein lipase and hepatic lipase in remnant lipoprotein fraction and their contents in post- and pre-heparin plasma samples collected by Dr. Havel at UC Davis. using HPLC, Superose 6B gel-filtration and new enzyme immunoassay systems (LPL and HTGL ELISA) developed by Dr. Nakajima and their associates in collaboration with Dr. Okajima

7. Research results:

We have found that most of the lipoprotein lipase (LPL) in circulating pre-heparin plasma was bound to remnant lipoproteins as inactive form. Also hepatic lipase (HTGL) was also found in apoE-rich HDL fraction in post-heparin and pre-heparin plasma. We have further investigated about the interaction between LPL and HTGL for the formation of remnant lipoproteins. As we have clarified the localization of LPL on remnant lipoproteins, we have proposed a new definition of remnant lipoprotein and the insight of its metabolism. Furthermore, we have proposed the new hypothesis of postprandial hyperlipidemia associated with the no change of LPL concentration and increase of remnant lipoproteins.

8. Publications and/or Presentations made through this collaboration

Sato K, <u>Okajima F</u>, Miyashita K, Imamura S, Kobayashi J, <u>Stanhope K, Havel P</u>, Tetsuo Machida T, Hiroyuki Sumino H. Murakami M, <u>Nakajima K</u>. Most lipoprotein lipase is bound to remnant lipoproteins in plasma: A new definition for remnant lipoproteins. In submission to Atherosclerosis

(Please summarize the report in 2 pages)