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ID No.：S-15089

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被招へい研究者作成／By Fellow
(招へい 2015)

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To:　President, Japan Society for the Promotion of Science

研究報告書(被招へい研究者作成)
RESEARCH REPORT (By Fellow)
(Cover Page)

This is the cover page of my attached JSPS research report.

1. Name of Fellow, Affiliation

Mauro Serafini, Council for Agricultural Research and Economics (CREA), Centre of Nutrition, Rome, Italy.

2. Name of Host, Position, Affiliation

Naoko Komenami, Associate professor, Department of Food and Nutrition, Kyoto Women's University

3. Research Theme under the Fellowship

The dietary management for reducing oxidative and inflammatory stress in disease prevention

4. Fellowship Period

10 / 27 / 2015 (From (Month/Day/Year)) ～ 12 / 23 / 2015 (To (Month/Day/Year))

5. Future Contact Information

Please look on the reverse side.

6. Outline of academic activities

Your report must be written in A4 size. Otherwise, you are free to choose its format.

Please see attachment letter and the pictures to the host for the Report

Note
Please select one picture (more than 800 kilobytes) which was taken when the Fellow conducted his/her research or provided a lecture, and attach it to Form 6-2. JSPS may later upload the excellent reports (Form 6-2) with the pictures of their authors in activities on our website. Fellows who do not want to have their pictures posted on our website are not asked to attach pictures to Form 6-2.

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Address (In English) ☐ **Office** ☐ **Other address**	
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URL: http://www.jsps.go.jp/english/e-plaza/20_alumni.html

Rome 27th December 2015

to: Prof. Naoko Komenami
Kyoto Women University
Kyoto

Subject: Report Activity Prof. Mauro Serafini, JSPS Fellowship ID N°S-15089

According to the JSPS program, I arrived in Kyoto on the 27th of October and left Japan on the 23rd of December. During this period I have been working according to the proposed plan and in conjunction with my Host Researcher, Prof. Naoko Komenami at Kyoto Women's University (KWU), Department of Food and Nutrition.

First of all, we organized different Lectures in Universities and Research Center in Kyoto and in other cities of Japan, as outlined in Annex 1. The title of the Lecture was: Dietary Modulation of oxidative stress in humans: the red-ox dilemma. A specific abstract was prepared (Annex 2), highlighting the outline of the Lecture, focusing on an hot topic of nutrition research and representing the specific area of my expertise: the role of diet in modulating oxidative stress in humans. Moreover, in order to provide specific information about my curriculum, research achievements, scientific publication and contacts to Professors hosting the Lectures and to the audience, a specific booklet was prepared and it is included in the Report.

The Lectures highlighted the importance of understanding more in depth the role of dietary antioxidants in disease prevention, more specifically was underlined the paramount importance of improving the research in human, due to the fact that most of the time there is not correspondence between the *in vitro* findings and the results form human intervention studies. A wide array of data set has been presented to support this aspect and, even more important, it was highlighted the different response to antioxidant intake or supplementation in healthy people characterized by cardiovascular risk factors, such as overweight, obese, old age, metabolic syndrome, smokers, high level of triglyceride etc. This last aspect represent an innovative and fundamental area of research, because provide a clear explanation of the different efficiency of dietary antioxidants according to the presence of an oxidative or inflammatory stress in human. In healthy and young people (lack of stress) dietary antioxidants are needed in relatively low amount to maintain redox homeostasis regulated by endogenous mechanisms. However, in subjects characterized by oxidative and inflammatory stress, the needs for antioxidants are much higher. In this specific conditions, dietary antioxidants represent a key strategy to potentiate the role of endogenous antioxidant defenses to counteract the raising oxidative stress originating form unbalanced dietary life style (post-prandial stress, high fat, energy and carbohydrate meals) and to define strategies of disease prevention based on antioxidants rich foods. The Lecture was giving also practical advices like avoiding milk addition to tea in order to do not lose the antioxidant power or always eating a fruit or a vegetable during a high fat meal to counteract the stress induced by the meal itself. This practical approach and the innovative hypothesis behind did always raise a

lot of consensus between the different audience at the different Lectures, stimulating a fruitful scientific discussion with the audience, that most of the time continued after the Lecture and provides new ideas for future research.

In this view, and after discussions about the research project conducted at KWU by Prof. Komenami, we identified a common and collaborative line of research able to highlight and valorize our respective skills and expertise and focused on what it is now the most important and practical aspect of nutrition research: the intervention studies in human. Specifically in Japan, but also in most of the wealthy industrialized countries, the raise of average age of the population bring to an increase of the cost of the health system, for this reason is crucial that, old people being maintained in good health and this can be achieved trough efficient strategy of dietary advices and life style recommendation to reduce metabolic stress and potentiate endogenous mechanism of body's defenses. In this view, we have identified the backbone for a common research project, to be developed in 2016-17, focused on the role of diet to modulate oxidative and inflammatory stress, through an improvement of body's antioxidants and immune system and maximizing the thermogenic efficiency of specific dietary patterns. Briefly, the project rely on a first part, where we will assess, in observational studies, the link between diet, oxidative stress, antioxidants and metabolism in different category of people (young, aged, overweight/obese), obtaining valuable information to be utilized in the second part of the Project. The second part of the Project will consist in tailored dietary intervention studies on similar category of person (healthy with CVD risk factors or aged people etc.) where we will investigate the role of specific food items, dietary pattern or combination of diet and physical exercises, in counteracting oxidative stress raised by dietary stressor (post-prandial/unbalanced diets) and to potentiate immune response (IgA). In this common project, intervention studies will be probably conducted in KWU, where will be collected dietary records, biological fluids and subject's information to be analyzed in Kyoto and Rome, according to the different expertise.

During my first Lecture at Tokyo University, for the meeting of the Asian Cohort Consortium, I met Prof. Manami asking me to come back to Tokyo for a more specific meeting with her staff at the Cancer Research Institute in Tokyo. During the meeting of the 10th December, we set the basis for a scientific collaboration between Prof. Manami and Myself on the understanding of the role of dietary antioxidants in cancer prevention in selected Japanese cohort studies. The group of Prof. Manami recently decided to tackle this innovative research aspect but, they did not have enough expertise on antioxidants, and they identified me as possible expert. During the meeting we decided to develop an antioxidant database for Japanese foods to be utilized to calculate the intake of dietary antioxidants in Japanese population and selected cohort studies. This information will be utilized to investigate the role of dietary antioxidants in cancer prevention, mainly on cancer where oxidative stress and diet can play a key role such as gastric, stomach and lung cancer. Moreover, we talked about the possibilities of measuring in Rome biomarkers for antioxidant status and oxidative stress from biological fluids of selected subjects of the Cohort, however this last aspect of the research is related to the possibility of attracting specific funding.

Together with Prof. Komenami we will also discussed about the possibility of writing common scientific paper for International journals. After reviewing the available set of unpublished data we identified four potential manuscripts to be written in the near future. Provisional titles of the manuscripts are described

in Annex 3.

In the view of further communicate the main findings from this Project a specific home page on the web will be activated. The web page will contain a brief sketch of myself, the abstract of the Lecture, pictures, the PDF copy of the power point presentation and the list of scientific publication related as well as contact detail for further questions and collaboration request.

Finally I would like to thanks JSPS for this great opportunity to establish collaborative link with Japanese scientists, University and Research Center and also for the important experience under a cultural and human point of view. I want also to thank JSPS for the opportunity to discover Japanese tradition, culture and history, I particularly enjoyed Japanese foods and Kyoto cuisine. I obtained many information about the link between diet and health that characterized Japanese diet, sharing the healthy characteristics of Mediterranean diet coming from my Country, despite very different in terms of type of food and cooking modality. I am thinking to write a book on the comparison and interrelationship between Japanese and Mediterranean diet under the healthy, nutritional and cultural point of view. I fully enjoyed the hedonistic pleasure of visiting Shrines and Temples during the autumn leaves period, in a wonderful boost of natural colors and the Exhibition "Rimpa" at the Kyoto National Museum.

Last but not the least I would like to thank the host researcher, prof. Komenami for introducing and welcoming me in Kyoto and for making my stay here unforgettable under a human and scientific point of view. During this time and, as described above, we have had the possibility of discussing about nutritional science, building up a collaborative link that I am sure will bring us a lots of scientific achievements at international level as well as reinforcing our newborn friendship and mutual respect.

Okini

Best Regards

Prof. Mauro Serafini
Highly Cited Scientist
Head of the Functional Foods and
Metabolic Stress Prevention Laboratory
Centre for Food and Nutrition
CREA, Italy

Annex 1. Visited list of professors (2015/12/14)

	Date	Research Activity	Name	Place	Department
1	Nov. 9	Asia Cohort Consortium Seminar	Prof. Manami Inoue	Tokyo University	Medical School
2	Nov. 11	Research Seminar	Prof. Akira Yorimoto, Hajime Hatta, Hiromi Katsura, Hiroshi Narita, Keiko Yokoyama, Kiyoshi Tanaka, Michinori Matsuo, Reiko Nakayama, Sadahiro Kawazoe, Saeko Imai, Shinya Matsumoto, Takashi Miyawaki, Yomiko Yoshino, Yukio Kawamura, Naoko Komenami	Kyoto Women's University	Food and Nutrition
3	Nov. 14	Visit of Nagahama Cohort Study	Dr. Takeshi Matsumoto	Nagahama Health Center	
4	Nov. 16	Visit of Elderly Exercise Class	Prof. Mikio Nakao, Dr. Miki Eto	Osaka University of Economics	Human Science
5	Nov. 17	Research Seminar	Prof. Junji Terao	Tokushima University	Medical School
6	Nov. 25	Research Seminar	Prof. Naoko Hiramatsu	University of Hyogo	Human Science and Environment
7	Nov. 30	Research Seminar	Prof. Manabu Shibasai	Nara Women's University	Life Science
8	Dec. 1	Meeting	Prof. Kazuo Chin	Kyoto University	Medical School

9	Dec. 1	Research Seminar	Prof. Tomoko Wakamura	Kyoto University	Medical School
10	Dec. 4	Research Seminar	Prof. Teruo Kawada	Kyoto University	Agriculture
11	Dec. 10	Asia Cohort Consortium Seminar	Prof. Manami Inoue	National Cancer Center	
12	Dec. 11	Research Seminar	Prof. Hiroshi Kiyono	Tokyo University	Institute of Medical Science

Annex 2. Abstracts Lecture

Dietary modulation of oxidative stress in humans: the Red-Ox dilemma

Prof. M. Serafini Ph.D.
JSPS Fellow

A large body of evidences has shown that oxidative stress (OS) plays a significant role in the development of degenerative diseases and chronic inflammatory status. Human body developed a sophisticated and co-operative array of antioxidant defenses to protect cellular district from OS. Despite the high grade of complexity and efficiency of endogenous defenses, the mechanism is not infallible and there is a need to optimize redox machinery with diet. Plant foods have been accredited of an antioxidant action *in vivo*. However, the extent to which they are able to tune oxidative stress and the identification of the dietary molecules involved is unclear as well as the association with the endogenous redox system. The role of antioxidant might be somehow of limited impact due to the non-physiological concentrations utilized, to the low degree of absorption of flavonoids and to their extensive metabolism within the body. Moreover, the mechanism of homeostatic control of antioxidant defenses under stress condition is not clarified and a clear detrimental effect of galenic antioxidant overloading has been shown in humans. All these unclear and somehow contrasting evidences raise the 'Red-Ox Dilemma'. The first systematic review evaluating the impact of plant foods on biomarker of antioxidant status and oxidative stress in more than 230 dietary intervention trials in humans will be presented and critically discussed attempting to unravel the Red-Ox Dilemma.

Annex 3.

1. Effect of breakfast composition on diet-induced thermogenesis and body temperature in healthy young women.

2. Effect of a physical exercise and stretching program on stress and IgA levels in saliva of Japanese elderly.

3. Association between abdominal visceral fat, lipid status and nutrient intake in rugby players.

4. Impact of breakfast skipping on diurnal rhythm of cortisol and IgA levels in young female students.