

PROGRESS REPORT FOR SPRINT PROPOSAL 09/04/2017

TTU: Prof. Naima Moustaid-Moussa

USP: Prof. Sonia Jancar

Awarded April 2016

Mechanisms mediating anti-inflammatory effects of omega 3 fatty acids in metabolic disorders: Role of lipid mediators and miRNAs

SUMMARY OF ACCOMPLISHMENTS:

1. TTU and USP team met in Summer 2016 at the International Immunology meeting in Australia
2. Prof Jancar Postdoc attended the 2016 FAPESP meeting at TTU and presented the SPRINT project
3. TTU Team visited USP in March 2017 and Prof. Moustaid-Moussa gave an invited lecture in the department of Immunology, Biomedical Institute at USP
4. A visiting scholar (Prof Jancar doctoral student Theresa Ramalho) is at TTU for one year (funded by CAPES, Brazil), April 2017-April 2018
5. One peer reviewed manuscript has been accepted for publication in the Journal of Investigative Medicine (In press)
6. Progress made in generating preliminary data with the goal of submitting a research manuscript next year.

Proposed Overview:

The goal of this joint TTU-USP proposal is to dissect mechanisms mediating obesity-associated inflammation capitalizing on expertise and preliminary data independently generated and published by scientists at both sites (Moustaid-Moussa, Ramalingam at TTU in the area of obesity, insulin resistance, miRNAs and omega 3 fatty acids; and Jancar and Filgueiras Ribeiro at USP in the area of eicosanoids, immune function, and diabetes).

We have conducted both cell culture studies of adipocytes and immune cells to identify changes in lipid and inflammatory mediators. We also tested effects of omega 3 fatty acids in these markers both in cell culture and in tissues from mice fed high fat diets with and without fish oil. We have also initiated experiments to determine the role of lipid mediators in diabetes. To date, we have identified several gene and microRNA candidates, which may be responsible for the preventive effects of omega 3 fatty acids. However, these require additional validation experiments to be conducted..

Papers:

A review paper is currently in Press, including Moustaid-Moussa's lab members and Sonia Jancar's visiting student and postdoc (**bolded names**):

1. Pahlavani, M., **Ramalho, T**, Jayarathne, S., Koboziev, I., Ramalingam. L., **Filgueiras, L.R.**, Moustaid-Moussa, N. Adipose tissue inflammation in insulin resistance: Review of mechanisms mediating anti-inflammatory effects of omega-3 polyunsaturated fatty acids. Journal of Investigative Medicine. In press, 2017

Data are being generated for a research paper related to the SPRINT project. Detailed plans have been discussed and established during the March 2017 visit of Prof Moustaid-Moussa and Dr. Ramalingam (TTU investigators) to Prof Sonia Jancar's lab at USP, towards development of the research manuscript followed by a grant submission. Further, the presence of Prof Jancar's student, Theresa Ramalho, at our lab this year, will help expedite achieving this objective. Data are currently been generated on both sides for this SPRINT project.

Proposals: We are working towards developing and submitting an NIH RO1 grant for an RFA announced by NIH entitled "Parallel Funding Initiative for Collaborative Research Between Investigators in the USA and in the State of São Paulo, Brazil". Such grant mechanism will require generating significant amount of data and publishing at least one joint research paper to submit a strong and competitive proposal, which is our ultimate goal.

Presentations:

- (1) One oral and one poster presentation were given by TTU faculty at the 16th International congress of Immunology conference held in Melbourne, Australia in August 2016. The Brazilian team also presented a poster and oral presentations. The conference was attended by Drs. Moustaid-Moussa, Jancar and Filgueiras Ribeiro. While these presentations were not on the joint project, they helped set the stage for discussing common research interests.
- (2) On behalf of the TTU/USP team, Filgueiras Ribeiro, postdoc fellow in Dr. Jancar's laboratory gave a presentation summarizing the proposed collaboration, during September 2016 FAPESP/SPRINT. Further, Dr. Ribeiro gave a research presentation in Nutritional Sciences, followed by extensive discussions of experimental plans related to the SPRINT project.
- (3) Prof. Moustaid-Moussa and collaborator Latha Ramalingam visited USP, Brazil in March 2017. Dr. Moustaid-Moussa gave a presentation in the department of Immunology, hosted by Dr. Jancar. During this visit, the team discussed available data and planned additional experiments for the coming year, to be conducted on each side, and also by Prof. Jancar's student, Theresa Ramalho during her visit at TTU.

Student and faculty Exchange:

Completed:

- (1) The team met at the 16th International Congress of Immunology in August 2016.
- (2) Filgueiras Ribeiro, at USP visited Texas Tech for 3 days during the workshop organized by the Office of International Affairs at TTU. During this time, he also visited and met Dr. Moustaid-Moussa's lab members and discussed plans for the joint project and experiments to be conducted by each lab.
- (3) Dr. Moustaid-Moussa and Dr. Ramalingam visited the University of Sao Paulo in March 2017. During their visit, Dr. Moustaid-Moussa gave a seminar at USP Immunology department, discussed their joint project and relevant preliminary data and the one year visit by Dr. Jancar PhD student, Theresa Ramalho.
- (4) Theresa Ramalho, a doctoral student in Dr. Jancar's laboratory at USP received CAPES funding from Brazil, through the "*Sandwich program*". She joined Dr. Moustaid-Moussa's lab to conduct part of her dissertation research related to one of the aims in the SPRINT proposal. She is at TTU from April 2017 to April 2018.

Progress and plans for the future:

Progress: As indicated above, the collaboration between our TTU and USP team is progressing well with mutual presentations, a manuscript in press and a visit Brazilian student at TTU. While funds are limited for conducting extensive experiments per se, efforts continue to make research progress.

Planned: As funds and time permits, a second visit may be planned by the TTU team to USP or by the Brazilian team to TTU over the next year to discuss progress. The team meets montly via skype to discuss results and plan accordingly. The visiting scholar from USP (Prof Jancar student) will actively conduct her project which include experiments planned in the SPRINT proposal. By the end of the SPRINT period in spring-summer 2018, we anticipate submission of a research paper. Upon acceptance, we will prepare an NIH application mentioned above and/or to another relevant RFA by another agency.