

## FINAL REPORT FOR VISITING RESEARCHER GRANT HENNING THRONE HOLST

This is the final report for the three-month research visit of Francisco B. Ortega to the Department of Biosciences and Nutrition, Karolinska Institutet, particularly to Marie Löf's research group, during 2016.

The productivity and usefulness of this visit has exceeded the expectation. We have fulfilled the 3 aims we indicated in our application as indicated below.

### Objective 1: To analyze data and draft manuscripts using existing data

- a) As planned, we organized two **seminars** during the visit of FB. Ortega. The goal of these seminar were to get to know better what both groups have been working on during the last years and to explore the potential of using existing data to work together on manuscripts. The title of the first seminar was "Physical fitness and activity assessments in young populations and health-related outcomes", which included talks about the MINISTOP project delivered by Marie Löf and about the ActiveBrains project, delivered by Francisco B. Ortega. Later on, we organized a second seminar titled "Preliminary results from the PREFIT project, Assessing FITness in PREschoolers". Francisco is the PI in this coordinated project that involves 10 cities across Spain, and the talk was delivered by Cristina Cadenas, a PhD student from Francisco's group who also did a short visit to Marie's group during this same period.
- b) During these 3 months, we have worked together on **seven papers** that have been submitted to top journals in the field. In addition, we are currently working on another **two manuscripts** that were initiated after the discussions held during this stay. Some examples of the titles of these papers are presented below.
  1. Cadenas-Sánchez C et al. Parental BMI and its association with body composition and lifestyle factors in their 4-year-old children: Results from the MINISTOP trial. Eur J Clin Nutr. 2017 May 3. doi:10.1038/ejcn.2017.62. [Epub ahead of print]
  2. Leppänen et al. Longitudinal associations of physical activity with body composition and physical fitness in pre-schoolers (MINISTOP). Med Sci Sports Exerc 2017, in press.
  3. Henriksson et al. Associations of Fat Mass and Fat-Free Mass with Physical Fitness in 4-Year-Old Children: Results from the MINISTOP Trial. Nutrients 2016, 8(8):473
  4. Delisle Nyström C et al. Mobile-based intervention intended to stop obesity in preschool-aged children: the MINISTOP randomized controlled trial. Am J Clin Nutr. 2017 Apr 26. doi: 10.3945/ajcn.116.150995. [Epub ahead of print]

### Objective 2: To exchange experience and knowledge between visitor and host

- a) **Improved methods in physical fitness assessment:** Francisco B. Ortega is an international expert on fitness assessment, and during his stay, our group at KI learned from his previous experiences on this topic. As an example, we have now included fitness assessment in a cohort study conducted in Linköping in 9-year-old children. The fitness tests and protocols that will be used were selected following Francisco's advice.
- b) **Exercise-based randomized controlled trials:** Francisco provided us with his expertise in exercise-based randomized controlled trials. We used that experience to apply for a project to FORTE which was selected to the second step of the evaluation, but not funded in the end. We are currently working on improving the proposal for the next call.
- c) **Exercise and cognitive performance:** We have been working on two major manuscript related with cognition and IQ. This has been a positive stimulation about the potential of this new research line, and the inclusion of some cognitive performance tests will be considered for the future projects to be conducted at KI.

- d) **Usefulness of m-Health (Smartphones) for implementing exercise interventions.** Marie has long experience in working on mHealth projects. This experience has been extremely useful for Francisco, who is involved in a H2020 project including a mhealth exercise intervention. In addition, Marie participated as a co-applicant in a project submitted to the Spanish Ministry of Sciences which includes an exercise-based mhealth intervention (the SmarterMove Project), with Francisco as PI. This project has been funded and will be conducted from 2017 to 2020. Similarly, Marie got another mhealth project funded by FORTE this year. Lessons learned from the MINISTOP trial and other mhealth projects directed by Marie in the past will be of great help.
- e) **Effects of exercise at a molecular level - transcriptomics.** This topic was not included in the original application for this stay. However, during Francisco's stay at the Department of Biosciences and Nutrition, we got in contact with Kaarel Krjutškov, a biotechnologist working at KI, and we established a promising collaboration to explore how exercise influences gene expression, using the latest techniques and knowledge from this leading group in transcriptomics. This collaboration has the potential to do a unique contribution internationally to better understand the molecular mechanisms behind the benefits of exercise on children's health.

### **Objective 3: To outline and start writing a future collaborative application**

As mentioned above, we have worked together in several applications for future projects, in which both Marie and Francisco are directly involved. **Two of these applications to the Spanish Ministry and to FORTE in Sweden on mhealth projects have been funded.** These two projects guarantee the continuation of this active and productive collaboration for the next years. In addition, Marie travelled to Spain to be part of a key meeting in which the application for an EU coordinated project to be submitted in 2017 was discussed. Furthermore, Francisco applied to create an excellence network about fitness assessment in Spain, with Marie as international co-applicant, which if granted will further strengthen the collaboration.

### **Researcher exchanges between Spain and Sweden**

During this summer and autumn, in addition to the visit of Francisco to KI for three months, and a short visit of Marie to Spain in September, there has been exchanges of researchers between both groups, strengthening and consolidating this collaboration. Cristina Cadenas is a PhD student of Francisco in Spain, and she visited Marie's group for three months from July to September 2016. Likewise, Christine Delisle Nyström visited Francisco's group for 1 month in October 2016. At the moment, there are two people who conducted their thesis under the supervision of Marie that are currently doing their postdoc stay in Granada mentored by Francisco. These two people are Pontus Henriksson and Hanna Henriksson. The communication between Granada and Stockholm takes place almost daily.

### **What was this grant used for?**

This grant was used to cover the extra cost of moving and living in another country, while still having housing expenses in Spain. Francisco moved to Stockholm with his wife and two children which increases the costs more than when living alone. The grant was used to pay the flights between Spain and Sweden, local transportation in Stockholm, renting an apartment, daily expenses, insurance, and the children's daycare.

### **Summary of the stay**

This collaboration has been very fruitful, resulting in a number of publications together and bi-directional exchanges of PhD and Postdoctoral students. The ultimate goal of this stay was to consolidate this

collaboration and establish even stronger links between both groups and universities that will enhance productivity and success. We believe that this major goal was fulfilled successfully.

We would like to thank Henning and Johan Throne-Holsts foundation for providing us with this excellent opportunity through this grant.

Best regards,

Marie Lof and Francisco Ortega

Stockholm 21 December 2016