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RECHERCHES**

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*Physical activity and exercise: from the prevention of
diseases to the maintenance of optimal functional
levels during aging*

Research unity:
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ABSTRACT

Research activities

My main research focus has always been related with the broad research area of exercise and physical activity during the aging process. Since my first research report written for obtaining my undergraduate diploma on STAPS, in the Brazilian University ESEF/UPE in 2003, I have been interested in investigating how physical activity and exercise may contribute to keep optimal functional capacities during aging. With this guiding thread in mind, I have investigated the preventive role of physical activity and exercise for both primary and secondary prevention regarding disease and functional capacity.

My research interests fully fitted within the research axes developed by the Gérontopôle (Head of Department: Prof. Bruno Vellas) of the University Hospital of Toulouse (CHU-Toulouse). Since my arrival in the Gérontopôle-CHU-Toulouse, first as a post-doc and currently as the Associate Coordinator of the Institute on Aging (located in the Faculty of Medicine of Purpan), I have improved my research skills and raised funding (see below in this document “VIII - Research funding”) on preventive physical activity and exercise strategies in the context of:

- (1) **Nursing Homes** – I have organized and led an international task force in 2015 on exercise recommendations for nursing home residents; 11 among the best experts in geriatrics, nursing care, exercise sciences have been present, such as John Morley (Saint Louis University, USA), Wojtek Chodzko-Zajko (Dean - Graduate College, University of Illinois at Urbana-Champaign, USA), and Francesco Landi (Universita Catolica del Sacro Cuore, Italy). I have also obtained research grants to investigate the effects of exercise on functional capacity in residents with dementia.
- (2) **Cognitive decline and Alzheimer’s disease** – I have obtained research grants to examine the feasibility and the effects on cognitive and physical function of a technology-based intervention (with a strong focus on exercise) in healthy older adults.
- (3) **Frailty and Sarcopenia** – I have been publishing reports on frailty and muscle function.

The close collaborations and, most recently, my affiliation with the UPS/Inserm UMR1027 (Head of unit: Prof. Sandrine Andrieu) “*Epidémiologie et analyses en santé publique: risques, maladies chroniques et handicaps*”, have provided me with the opportunity to continuously develop my methodological and statistical skills. In this context, I have been actively collaborating in the last 5 years with **Team 1** (Aging and Alzheimer disease: from observation to intervention) of this joint research unit. Furthermore, using major datasets already available in the Gérontopôle-CHU-Toulouse and in Europe (eg, the SHARE study), I have been publishing scientific papers in international high-impact Journals, totalizing more than 70 publications, including in major Journals such as BMJ and Lancet.

In order to respond to my research questions, I have had the opportunity to employ different research designs:

- (1) **Qualitative studies** – for example, during my PhD thesis, I have examined the barriers and motivators to exercise for older adults with functional limitations (people receiving help for instrumental activities of daily living, such as household chores)
- (2) **Observational studies** – cross-sectional as well as longitudinal studies, including the large European SHARE study with more than 100,000 people.
- (3) **Clinical trials** – quasi-experimental (eg, the IQUARE study; n=6275 people) as well as randomized (including cluster-randomized) controlled trials (eg, the LEDEN study).
- (4) **Meta-analysis** – I have undertaken three meta-analyses of randomized exercise trials.

Supervising activities

I have been supervising post-doctoral fellows, physicians, and Master students for the last 5 years and have co-signed several scientific papers related to this activity. Currently, I

am Associate Coordinator of the Institute on Aging (Coordinator: Prof. Matteo Cesari), in which one of my tasks is to manage the daily activities of an international research team (post-docs and physicians from UK, Canada, Germany, South Korea, Nepal, France) and to stimulate them to continuously improve their research skills to the highest standards.