MUTIDIMENSIONAL APPROACH TO THE FRAILTY SYNDROME OF THE ELDERLY: CONTRIBUTION OF NEW OPTICAL IMAGING METHODS TO DIAGNOSIS AND EVALUATION OF RESPONSIVENESS TO THERAPY

PhD Candidate: Agnese Segala

Email: a.segala003@unibs.it

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Tutor: Prof. Alessandra Valerio; Prof. Paola Taroni

Background

Frailty is the most problematic expression of population ageing. It is a state of vulnerability to stress conditions and is a consequence of cumulative decline in multiple physiological systems over a lifespan. In this context, the absence of agreement on an operational definition of frailty in clinical settings has become a major concern.

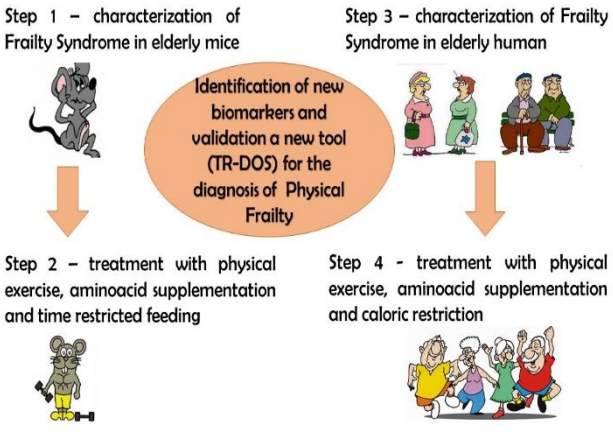
Objectives

This study aims to investigate multidimensional aspects of the frailty syndrome, with a particular focus on the muscular component of sarcopenia/ physical frailty. In this context, the use of the optical method of TR-DOS (time resolved-diffuse optical spectrometry) will be investigated as a potential new diagnostic tool.

Methodologies

TR-DOS will be used to detect tissue composition and structure, and eventually the progressive appearance of atrophy of muscle fibers in C57BL/6J male and female mice of different ages. Moreover, nutritional and physical interventions aimed to delay the onset of frailty syndrome will be tested.

In addition, TR-DOS will be applied to non-sarcopenic, sarcopenic, and sarcopenic-obese elderly human of both sexes and clinical trials will be undertaken to evaluate the effects of lifestyle changes and aminoacid supplementation on the severity of the disease.



Expected Results and Impact

Obtain information about the ability of TR-DOS to detect changes in composition and function of the muscle tissue. These parameters will be correlated to the clinical indices of sarcopenia and physical frailty. Investigate the responsiveness to exercise, caloric restriction and aminoacid supplementation interventions of the frailty mice and elderly subjects; their possible interactions and the possible difference between the sexes.