

TITOLO: MAP-ESA Astronaut exercise prescriptions promoting health and fitness on earth

DATA INIZIO: novembre 2011

DURATA: 24 mesi

DIPARTIMENTI CHE PARTECIPANO: Dipartimento di Scienze Neurologiche, Neuropsicologiche, Morfologiche e Motorie

RESPONSABILE DEL PROGETTO: Carlo Capelli

FINANZIAMENTI o FONDI DI RICERCA GESTITI DALL'ATENEO:

- NOME DELL'ENTE FINANZIATORE: ESA (EUROPEAN SPACE AGENCY)
- ANNO: 2011
- IMPORTO TOTALE: 100.000 €
- TIPO: gestito dal Dipartimento

OBIETTIVI: Prof. Capelli's research program title is "Cardiovascular and skeletal muscle responses to chronic concurrent exercise/training using flywheel technology in adult and old men", which is a part of a large project funded by means of the European Space Agency MAP contract "Astronaut exercise prescriptions promoting health and fitness on Earth".

This study is aimed at evaluating the effects of physical training programs based on the flywheel technology (modified for isotonic cycling exercise) in senior subjects (50 to 70 y). We will correlate functional physiological parameters with molecular data related to changes in gene expression investigated in blood cells/muscles.

Male volunteers each will be recruited and randomly assigned to a treatment and control group, respectively. After anthropometrical, physiological and strength evaluation, ($\dot{V}O_2$ peak, exercise capacity, maximal isometric force of the knee extensors, muscle mass and cross sectional area, oxygen uptake and oxygen delivery kinetics), will perform before and after training program lasting 10 weeks utilising a flywheel inertial ergometer (Yo Yo). After 3 months of recovery a standardised cycling training protocol will be applied following the same scheme.

Functional data will be also correlated with the molecular changes investigated from microarrays analysis after blood sampling.

PERSONE ESTERNE CHE PARTECIPANO AL PROGETTO:

- Karolinska Institutet
- Ostersund Rehabcenter
- Umea University
- Karolinska University Hospital
- Università di Barcellona
- Università di Copenhagen - Bispebjerg hospital