WISE study starts in Toulouse: 60 days of bed-rest for terrestrial female astronauts

March 21 2005

Since Saturday, 19 March, the study entitled Women International Space Simulation for Exploration (WISE) has been fully under way. All participants in the first of two campaigns have been lying in bed, tilted head down at an angle of 6º below horizontal, so that their heads are slightly lower than their feet.
This position results in physiological changes that also occur in astronauts during space flight. The study will assess the roles of nutrition and combined physical exercise in countering the adverse effects of prolonged gravitational unloading by bed-rest.

The first volunteers arrived at the MEDES Space Clinic in Toulouse on 22 February for the start of the collection of physiological data, which will serve as the baseline data throughout the whole study. This preliminary period lasted 20 days, after which the first two volunteers went to bed; the last two, who arrived on 27 February, did so on 19 March.

More than 1600 women responded to the ESA call for candidates, which closed in January. As planned, twelve women were selected for this first campaign. They come from France, Great Britain, Germany, Finland, The Netherlands, Poland, and the Czech Republic, so that the WISE study also attracted great interest in the new member countries of the European Union.

This study is a joint venture between the European Space Agency (ESA), the French space agency (CNES), the National Aeronautics and Space

Administration (NASA) and the Canadian Space Agency (CSA). It is being carried out by MEDES, the French Institute for Space Medicine and Physiology, in the clinical research facility at the Rangueil hospital in Toulouse, France.

WISE needs 24 female volunteers altogether, who will remain in bed for a total duration of 60 days. The test subjects will be divided into three groups of eight. One will be the control group, receiving no extra stimulus over the course of the bed-rest period. The second group will undertake an exercise programme whilst in bed. The third will receive a nutritional supplement throughout the 60 days.

For the 20 days prior to the bed rest period, the test subjects will take part in the collection of baseline data. During the 20 days following the bed-rest period they will undergo similar tests for comparison with the baseline data. The WISE study is being conducted in two campaigns, with 12 volunteers in each. The second campaign starts in September. Volunteers can still apply.

The data collected by WISE will be used to draw conclusions about such aspects as muscle condition, blood parameters, cardiovascular condition, coordination of movements, changes in immune system, bone formation and psychological wellbeing. External experts reviewed all scientific protocols of the study prior to selection, and the responsible French ethical committee in Toulouse has approved the integrated study design of WISE.

With the European Space Agency's future plans for human space exploration, the results expected from WISE will prove valuable in planning long-duration human missions. This research will also have clinical significance on Earth, advancing knowledge and pointing to improved methods of assisting recovery by bedridden patients. Studying the early effects of reduced activity on a molecular level is expected to

provide further evidence of the benefits of regular exercise in the prevention of conditions like type 2 diabetes and high blood pressure.

Source: NASA