CNES and MEDES conduct “dry immersion” study on the physiological effects of weightlessness

Since 12 January and through to 19 February, 12 men aged between 20 and 45 are testing out a new method for simulating weightlessness called “dry immersion” at the MEDES space clinic in Toulouse.

The chief goal of this study led by CNES is to study the effects of a ground-based model simulating the effects of weightlessness known as “dry immersion”. This is the first time this model developed and used by Russian scientists has been tested in Europe, where the ‘bedrest’ model is more widely used. It is thought the dry immersion model could be a useful complement to bedrest studies, as it induces certain physiological effects that the bedrest model is unable to replicate accurately. The dry immersion model could even offer promise for traditional medicine, for example in treating salt-water imbalance, for physiotherapy or for sportsmen and sportswomen.

How does dry immersion work?
The subject is immersed in a sort of purpose-designed bath filled with water that is then covered with a special waterproof fabric attached around the rim of the bath to keep the subject dry. They thus feel as if they are floating. As support is distributed equally over the entire bodily surface, the body in fact interprets this as a complete lack of support, a situation comparable to that experienced in real microgravity conditions.

CNES therefore decided to conduct this first pilot study to assess the model’s value. A total of 12 healthy male volunteers aged between 20 and 45 are taking part at the MEDES space clinic at Rangueil Hospital in Toulouse. After a first day in hospital, the volunteers are subjected to:
- 3 days of basic tests
- 3 days of dry immersion
- 2 days of post-immersion tests and recovery

Five teams of scientists are working on the project to study loss of muscle mass and strength, fluid shifts and the adaptation of the central and peripheral nervous system, cardiovascular regulation, the spine and bone remodelling.

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