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From the South Pole to the ISS – AWI and DLR to conduct joint health research in the Antarctic

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The Neumayer-Station III in Antarctica

The Alfred Wegener Institute for Polar and Marine Research (Alfred-Wegener-Institut für Polar- und Meeresforschung; AWI) and the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) intend to carry out health research together. On 23 November 2009, both partners signed a cooperation agreement to conduct bio-medical studies at Neumayer-Station III in Antarctica. In two projects, scientists will monitor the health of the station crew and study the physical and psychological effects of long-term isolation during the winter months in the Antarctic. The studies complement similar experiments that are being carried out on the International Space Station (ISS) and will thus prepare for long-term missions to the Moon and Mars.

Circulation and immune system at the focus of research

The extreme conditions under which the climate, biological and geological researchers at Neumayer-Station III live and work resemble those faced by astronauts during a space mission. Isolation, external dangers, physical and psychological stress, as well as the absence of the normal transitions between day and night, affect their health and wellbeing. In the two projects that have so far been chosen, research will focus on the cardiovascular system and the immune system of humans.

It has long been known that spending time in space affects an astronaut's immune system. This also applies to people under stress and in extreme environmental conditions. However, the exact reasons for this and the mechanisms at work remain unknown. This is what scientists at the Ludwig Maximilians University in Munich now want to find out. To do this they are planning immunological studies at the research station.

The International Space Station (ISS)

In the second project, researchers from Berlin's Charité university hospital will track the formation of blood components and the regulation of the circulatory system, as well as the activity and sleeping patterns of those wintering in Antarctica. Following the completion of the studies, the two scientific teams will compare the results of their tests with data from similar experiments that are being carried out on the ISS and in other extreme environments.

The results will have concrete practical relevance for those wintering in the Antarctic and for long-term missions in space. In addition, important contributions to the fundamental understanding of metabolic and cardiovascular regulation and the immune system are expected as a result of this cooperative research programme between AWI and DLR.

AWI will provide infrastructure, logistics and staff at the station for this collaboration. DLR's Space Agency will support the scientific projects at the universities organisationally and financially, with funds from the German Federal Ministry for Economics and Technology (Bundesministerium für Wirtschaft und Technologie; BMWi). Initially, the cooperation has been agreed for a period of five years and will then be extended in two-year cycles.

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