SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
In Orbit - Postgraduate Space Education (4)

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THE HELMHOLTZ SPACE LIFE SCIENCES RESEARCH SCHOOL (SPACELIFE):THE FIRST GENERATION OF DOCTORAL CANDIDATES

Abstract

Training young researchers in the field of space life sciences is essential to vitalize the future of space-flight. In 2009, the DLR Institute of Aerospace Medicine in Cologne established the Helmholtz Space Life Sciences Research School (SpaceLife) in cooperation with several universities, starting with 22 doctoral candidates. SpaceLife offers an intensive three-year training program for early-stage researchers from different fields (biology, biomedicine, biomedical engineering, physics, sports and space sciences). The candidates from Germany as well as from abroad attend a curriculum taught in English composed of lectures, practical training, lab exchanges, workshops and elective courses. During the first doctoral students' workshop, every candidate presented his/her research topic including hypothesis and methods to be applied. The progress report is due after 1.5 years and was presented by each candidate at the 2nd SpaceLife Doctoral Students' Workshop in Kiel, Germany, on March 14-18, 2011. Furthermore, the doctoral candidates participated in a research skills development course, a communication and presentation skills course and a career and leadership course. The whole program encompasses 303 hours and is complemented by active participation national and international conferences. New doctoral candidates will be admitted in fall 2012 and will participate in a conjoint Autumn School together with the first generation of candidates.

The doctoral theses cover different topics from the fields of space physiology, radiation measurements and radiation protection, radiation and gravitational biology, and astrobiology. Training and immobilization studies reveal muscle and bone alterations, including ultrastructural and molecular changes. The efficiency of a new robotic controlled training device is currently tested as possible countermeasure against space-flight induced muscle and bone loss. New radiation detectors are designed and tested, and simulations of radiation exposure complement the radiation measurements. Understanding of the cellular response to space radiation might enable development of pharmacological countermeasures and help to reduce the uncertainty in risk assessment. The effects of gravity alterations and of changes in the salt metabolism on cells of the innate immune system are important topics in gravitational biology. In the field of astrobiology, the tolerance of microorganisms against extreme physical and chemical environmental parameters is investigated.

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