

## Russian Space Biology and Medicine

This past summer I had the opportunity to attend a two-week short course in Russia on Space Biology and Medicine. The program was organized through the Faculty of Medicine of Lomonosov Moscow State University (MGU), The Institute for Biomedical Problems (IBMP) of the Russian Academy of Sciences, and Contemporary Educational Programmes.

The majority of the two weeks consisted of attending around 5 hours of lectures per day covering three to four separate topics. Classes were taught in English, with a translator readily available when necessary. The syllabus addressed most of the major effects of space flight on humans (e.g. development and aging, radiation, space motion sickness, motor control, muscle and bone atrophy, hormonal regulation, immunology and post flight orthostasis), as well as plant growth studies, chronobiology, microbiology, psychology, medical protocols, in flight countermeasures and post flight rehabilitation. As a result of the institutional structure of the Russian program, locally resident scientists were available to present detailed, up to date information on topics of which they were currently active in research. It was especially interesting to gain insight into work that was not yet readily available in the literature. Several Cosmonauts also addressed the group, including Dr. Valery Polyokov, current record holder for the longest duration single stay in space (438 days). One of the 'hands on' highlights for me was actually being able to get into the dry immersion test bed for a few minutes (see photo). This really brought to life what was previously only an academic understanding of how this device simulated weightlessness. Others in the group were able to try out the ISS treadmill (TVIS) and Cycle Ergometer.



*The author experiencing 'simulated weightlessness' by Dry Immersion*

In addition to time spent in labs and classrooms, several excursions were arranged to nearby destinations of interest. As a group, we visited the Yuri Gagarin Cosmonaut Training Center in Star City, where we saw the Mir and Soyuz trainers and the underwater neutral buoyancy facility. Another day-long outing afforded us the occasion to view a collection of space artifacts housed in the Zvezda Research Production Center and to tour Moscow's Mission Control Center. In the limited free time available, I also managed to see the Cosmonaut Museum and the Space Shuttle *Buran*, sadly now relegated to being a tourist attraction in Gorky Park.

So much firsthand exposure to current and historical aspects of the Russian Space Program alone made the trip worthwhile. Taking in the sights of Moscow along and seeing Tchaikovsky's Swan Lake performed at the Bolshoi Theater made the overall experience all the more memorable. It was almost surreal to be sitting on the outskirts of Red Square enjoying a bowl of hot Borsch chased down by a shot of cold Vodka in the warm glow of a sunset, as midnight approached.

For anyone with a genuine interest in space life sciences, and especially for those who have not had the opportunity to visit Russia and are not averse to enduring the minor frustrations that inevitably accompany travel in a foreign culture, this opportunity presents a chance of a lifetime. Just be prepared for some adventure and be sure to pack a little extra patience. Information regarding this summer's program is posted online at <http://www.cep.ru/smss.shtml>. You can also contact Dr. Mikhail Grafov ([grafov@cep.ru](mailto:grafov@cep.ru)) for details and feel free to email me ([klaus@spot.colorado.edu](mailto:klaus@spot.colorado.edu)) if you are interested in attending and have other questions.

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