Resident’s project on osteoporosis flies with Shuttle

Dr. Kevin Forkheim, a resident at the University of British Columbia, sent a research project into space Oct. 29. Forkheim’s microgravity research project on osteoporosis was aboard the Space Shuttle *Discovery* as part of NASA’s studies on aging. Forkheim, 27, is completing the first year of a radiology residency at UBC. The highlight of this *Discovery* flight was the presence of US Senator John Glenn who, at 77, is the oldest person to fly in space. Thirty-six years ago he became the first American to orbit the Earth. He was on the latest Shuttle flight as a test subject in a study of the effects of microgravity on aging.

Forkheim’s project is an international collaboration involving Canadian and Israeli researchers. Dr. Eran Schenker, a gynecologist, headed the Israeli team. Forkheim says the project has important implications because of the growing costs associated with the treatment of osteoporosis. It is estimated that Canada alone spends more than $1.3 billion annually treating fractures related to osteoporosis.

Forkheim’s experiment involved sending osteoblasts, the bone building cells, into space to study changes that occur in microgravity. The study will also be investigating if drugs such as 1,25-(OH)₂ vitamin D can be used to slow the progression of osteoporosis.

It is estimated that osteoporosis will affect 1 in 4 woman and 1 in 8 men over age 50. Seventy percent of hip fractures are caused by osteoporosis; 20% of women and 34% of men who sustain a hip fracture will die within a year because of complications.

Osteoporosis also affects astronauts during long missions. It is estimated that they lose 1% to 2% of their bone mass for each month they are in space; the osteoporosis that occurs in microgravity is very similar to the osteoporosis found on Earth.

Previous research by Forkheim and Schenker, which was part of a November 1996 Shuttle flight, determined that osteoblast cells exposed to microgravity experience many changes when compared with cells grown on Earth. Cells exposed to microgravity demonstrated a lower proliferation rate, a lower metabolism and an altered cell structure. Microgravity refers to the state of near weightlessness experienced by Shuttle crews.

Earlier this year Forkheim was named first runner-up for the Aerospace Medicine Association’s Young Investigator of the Year award for his part in that research. Forkheim and Schenker also sent mice embryos into space on the same mission to study the effects of weightlessness on early cell division.

This experiment is sponsored by UBC, the Capital Health Regions Hospital in Victoria, the Israeli Ministry of Health and the Israeli Space Agency. “As we are nearing the beginning of the International Space Station era,” says Forkheim, “it is becoming more important for countries to work together to solve common global problems. I hope space research will continue to be a platform to promote global cooperation between different nations to solve common problems.”

More information is available from Forkheim, kforkheim@caphealth.org.

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Dr. Kevin Forkheim in the laboratory