

FOR IMMEDIATE RELEASE

Bone Loss Therapy to be Studied on International Space Station

AAO Foundation provided original funding for this stellar project

St. Louis, MO (February 16, 2015) – In January, National Aeronautics and Space Administration (NASA) in conjunction with the Center for the Advancement of Science in Space (CASIS) announced that an UCLA School of Dentistry project that first received support from the AAO Foundation more than 18 years ago is now heading to the International Space Station in 2016 as one of its first mammalian studies. The mission, “Systemic NELL-1 Therapy for Spaceflight-induced Osteoporosis,” will allow astronauts on the space station and scientists on Earth to collaboratively test a potential new therapy for accelerating bone growth in humans.

In the mid/late 90’s, Dr. Kang Ting, currently Professor & Chair in the Section of Orthodontics at UCLA School of Dentistry, was junior faculty working on several, successive research projects funded by the AAO Foundation concerned with bone loss ailments. Following this early work, Dr. Ting discovered the NELL-1, a bone-forming molecule, which led to a National Institutes of Health (NIH) grant, and then to the space station project. “Without the initial seed funding from the AAO Foundation, all of this would not have been possible,” said Dr. Ting. “The AAOF was the very first group that put not only their support, but also their trust in an orthodontic junior faculty 18 years ago and proved that reaching for the sky – or heading into space – is not a dream but rather a reality 18 years later.”



Dr. Kang Ting

The upcoming mission involves sending 40 rodents to the space station to live in a microgravity environment for two months during the first ever test of NELL-1 in space. Since prolonged space flights induce extreme changes in bone and organ systems that cannot be replicated on Earth, moving the study to space puts the research on an accelerated schedule. The International Space Station (ISS) study will test the NELL-1 molecule’s ability to prevent bone degeneration or osteoporosis, as well as induce bone formation of massive bone defects that can occur in wounded military personnel. The results of the study will impact formulating a treatment for patients with osteoporosis, a significant health issue commonly associated with “skeletal disease” conditions such as immobilization, stroke, cerebral palsy, muscular dystrophy, spinal cord injury, and jaw resorption after tooth loss.

“CASIS is proud to work alongside UCLA in an effort to promote the station as a viable platform for bone loss inquiry,” said Warren Bates, director of portfolio management for CASIS. “Through investigations like this, we hope to make profound discoveries and enable the development of therapies to counteract bone loss ailments common in humans.”

The four-person UCLA research team will begin ground operations in early 2015 in tandem with a flight operation coordinated by NASA and CASIS. Dr. Chia Soo, a UCLA professor of plastic and reconstructive surgery and orthopedic surgery, member of the Eli and Edythe Broad Center of Regenerative Medicine and StemCell Research, will lead the UCLA team. She is also research director for UCLA Operation Mend, which provides medical care for wounded warriors. Dr. Ting will be an active participant, as well as Dr. Ben Wu, a professor of bioengineering who modified the NELL-1 molecule to make it useful for treating osteoporosis. Dr. Jin Hee Kwak, an assistant professor of dentistry, Section of Orthodontics will manage the study's daily operations.



Dr. Jin Hee Kwak

The average mission cost per flight to the International Space Station is over \$133 million. The AAOF project constitutes a significant part of the NASA/CASIS mission in their upcoming flight and enhances the biology of space travel in terms of inhibiting microgravity-induced bone loss.

“We are pleased to be involved in an undertaking of this magnitude,” said Dr. Robert James Bray, AAOF President. “To think that a small project started with a relatively modest amount of AAOF funding and designed to encourage junior faculty to develop themselves into educators and researchers has now become a part of an International Space Station mission is amazing.”

The breadth and scope of this endeavor has expanded exponentially since first initiated. Over the years, this research project has received more than \$18 million in grant support from the Center for the Advancement of Science in Space and National Institutes of Health, the National Institutes of Health, the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA, the UCLA School of Dentistry, UCLA department of orthopedic surgery, and the UCLA Orthopedic Hospital Research Center.

The AAO Foundation is the charitable arm of the American Association of Orthodontists and its mission is to support orthodontic education and research, designed to benefit the specialty of orthodontics, primarily in support of junior faculty, and this investment has resulted in hundreds of publications and abstracts, most of which have been published in journals within orthodontics, but many in journals outside the specialty and the profession; scores of lectures at dental, orthodontic and at other scientific meetings; dozens of tenured, associate and full professor positions; and 15 NIH grants. On the AAOF web site (www.aaofoundation.net), there are Final Reports from over 300 peer-reviewed, funded proposals.

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