You're Invited

DEPARTMENT OF HEALTH & KINESIOLOGY

Charles Cowell Lecture

Wednesday, October 30, 2019 3:30 to 5:00 pm Armstrong B071

Lynda Bonewald , PhD

Dr. Bonewald is the Founding Director of the Indiana Center for Musculoskeletal Health, ICMH, a center with over 100 members from 27 schools and four campuses. She received her Ph.D. in Immunology/ Microbiology from the Medical University of South Carolina, was promoted from Assistant to Full Professor at the Univ. of Texas Health Science Center at San Antonio and served as director of the Bone Biology Research Program and as Vice Chancellor for Research at the University of Missouri-Kansas City. She is a Past-President of the American Society for Bone and Mineral Research, ASBMR, and the Association of Biomolecular Resource Facilities. She has served as Chair of the Board of Scientific Councilors for the NIDCR and served on Council for NIAMS. She received the "Basic Research in Biological Mineralization Award" from the IADR, the "RIB Award" from Sun Valley, and the prestigious William F. Neuman award from the ASBMR. She has been continually funded by NIH for thirty years and is best known for her work in the study of osteocytes and is responsible for tools used by researchers globally to determine osteocyte biology and function. She is currently studying bone to muscle crosstalk with aging.

The Muscle Metabolite, β-aminoisobutyric acid, L-BAIBA, Enhances the Effects of Exercise.

Muscle is now recognized as a source of signaling molecules that can have both positive and negative effects on bone. L-BAIBA, a metabolite produced by contracting muscle, attenuates both bone and muscle loss due to hindlimb unloading (Kitase et al, Cell Reports, 2018). The L(S) enantiomer of BAIBA was 100-1000 fold more potent than the D form in preventing osteocyte cell death due to reactive oxygen species, so this form was used for all studies. To determine if L-BAIBA could enhance the anabolic effects of mechanical loading on bone formation, we performed suboptimal anabolic loading of bone with and without BAIBA in five month old male and female mice. To determine if L-BAIBA could enhance the effects of voluntary wheel running with aging, 12 mo old female mice were allowed access to wheels for six months with and without L-BAIBA in their drinking water until 18 months of age. L-BAIBA had no effect on bone in the anabolic loading experiments but enhanced the effects of suboptimal loading on new bone formation. L-BAIBA had no effect alone in aged mice but enhanced the effects of voluntary wheel running on muscle protective factors. These observations have implications for identifying a means to boost suboptimal skeletal loading conditions such as space flight, immobilization, and aging, while also improving the force output of skeletal muscles.

PURDUE
HEALTH & HUMAN SCIENCES

HEALTH AND KINESIOLOGY