

Bone health advances

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A UT Arlington researcher's recently published study is being heralded as an advance in understanding that could one day influence the treatment of patients with difficult to heal bone fractures and diseases like arthritis.

Rhonda Prisby, an assistant professor of kinesiology in the College of Education and Health Professions, is the lead author on an article published in the November issue of the *Journal of Bone and Mineral Research*, the official publication of the American Society for Bone and Mineral Research. She collaborated with French and Canadian scientists on a study of parathyroid hormone or PTH.

PTH is often used as a treatment for osteoporosis. It binds to bone cells to stimulate an increase in bone mass. Prisby's team wanted to examine the interaction between PTH and vascular endothelial growth factor or VEGF A, a protein released in the body to create new blood vessels.

“When we administered PTH intermittently for 15 and 30 days we saw increases in bone mass just as we expected,” Prisby said. “But bone blood vessel numbers were decreased with PTH. That was the opposite of what we expected.”

Instead, researchers noticed that by working through a mechanism related to the VEGF A, PTH caused small blood vessels in the bones to redistribute themselves closer to the surface of the bone. Being closer to the surface of the bone allowed the small blood vessels to more efficiently support growth through delivery of nutrients and oxygen and

elimination of waste. That redistribution of the small blood vessels contributed to the increased bone mass, the team concluded.

“To our knowledge, this is the first investigation to demonstrate that bone marrow blood vessels have the capacity to alter their spatial location in response to stimuli and relocalize to the vicinity of bone-forming sites,” the study, which is available online, said.

Having a researcher with Prisby’s talent at UT Arlington benefits students in the classroom and in the lab, said Jeanne Marcum Gerlach, dean of the College of Education and Health Professions.

“Her research is so valuable and she’s one of the top in her field,” Gerlach said. “Her work shows students the real-world applications that research can achieve.”

A commentary in the November issue of the journal singled out both the methods used by Prisby and the research team and their results for praise.

Dwight A. Towler, Ira M. Lang Professor of Medicine, Barnes-Jewish Hospital at Washington University Medical Center, said: “This unparalleled, quantitatively robust analysis of bone vascular anatomy and its regulation by PTH has provided truly novel insights into how anabolic signals control and coordinate bone mass accrual via VEGF signaling in the bone-vascular axis.”

Towler’s commentary said a fundamental understanding of bone-vascular interactions could have a major impact on strategies to build new [bone](#) in everything from cancer cases to old age.

Provided by University of Texas at Arlington

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