

Effect of Radius on Load Distribution within Mouse Forearm Structure: Experimental and Numerical Analyses

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It has been hypothesized that osteocytes are stimulated by local strain distribution within the bone subjected to mechanical loadings. This collaborative research project between bone biologists and mechanical engineers is attempting to identify local strain fields around osteocytes that can account for their behavior in response to loading. Using μ CT images we have built and conducted an extensive finite element study of the mouse forearm. Our model incorporates many components of forearm anatomy not previously included in these models such as the radius and marrow cavities. The results of the current research will shed light on how bone perceives mechanical load and the pathway whereby a physical load is transduced into a biochemical signal that eventually results in new bone formation. The study will help in developing new treatments for bone diseases such as osteoporosis.