

## **ACOUSTICS2008/312**

### **Present state and future trends in ultrasonic characterization of bone**

Pascal Laugier

Université Paris 6, Laboratoire d'Imagerie Paramétrique, 15, rue de l'Ecole de Médecine, 75006 Paris, France

Although it has been over 20 years since the first recorded use of a quantitative ultrasound (QUS) technology to predict bone fragility, the field has not yet reached its maturity. QUS have the potential to predict fracture risk in a number of clinical circumstances and has the advantages of being non-ionizing, inexpensive, portable, highly acceptable to patients and repeatable. However, the wide dissemination of QUS in clinical practice is still limited and suffering from the absence of clinical consensus on how to integrate QUS technologies in bone densitometry armamentarium. There are a number of critical issues that need to be addressed in order to develop the role of QUS within rheumatology. These include issues of technologies adapted to measure the central skeleton, data acquisition and signal processing procedures to reveal bone properties beyond bone mineral quantity and elucidation of the complex interaction between ultrasound and bone structure. In this presentation, we review recent developments to assess bone mechanical properties. We conclude with suggestions of future lines and trends in technology challenges and research areas such as new acquisition modes, advanced signal processing techniques, and models.