

Ultrasound techniques used in Functional Morphological Hand
Research, BioMed Institute and Jessa Hospital, University of Hasselt, Belgium.
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ITEM 7. NATIONAL ACOUSTICAL LABORATORIES AND RESEARCH ACTIVITIES:

1) Ultrasound techniques used in Functional Morphological Hand Research, BioMed Institute and Jessa Hospital, University of Hasselt, Belgium.

In the past few years, various photo-acoustic approaches have been applied to visualise soft tissues of healthy small joints of the finger, especially their tendons and ligaments (Wang et al., 2007, *Optics Letters*, 32, 20, 3002-3004; Sun et al., 2009, *Journal of Biomedical Optics*, 14, 6, 064002, 1/5). Results in vitro and in vivo respectively, were matched to cross-sectional histological images and to in vivo MRI cross-sections from similar joints. Especially the images by Wang and co-workers realistically display micro-anatomical positions of the extensor assembly's lateral tendon bands relative to the trochlea and the proper collateral ligaments, at the level of the proximal interphalangeal (PIP) joint. In 2010, a comparable matching of HR MRI cross-sections of a PIP joint in vitro was performed, relative to healthy PIP joints in vivo both in extension and flexion, visualised by HR Ultrasound (Philips iU 22, linear probe, 5-14 MHz, with a water-based ultrasound gel). These detailed techniques were supervised by C. Thywissen, Radiology, Jessa Hospital, Hasselt and K. J. van Zwieten in cooperation with P.L. Lippens, K. P. Schmidt and I. Lambrichts, Functional Morphology, University of Hasselt. Thus, the lateral bands' positions at various PIP flexion stages in vivo showed fair matches with previous in vitro observations (Van Zwieten et al., 2008, *Journal of Hand Surgery*, 33, 1, 170-171). (See: <https://uhdspace.uhasselt.be/dspace/handle/1942/11210>).