

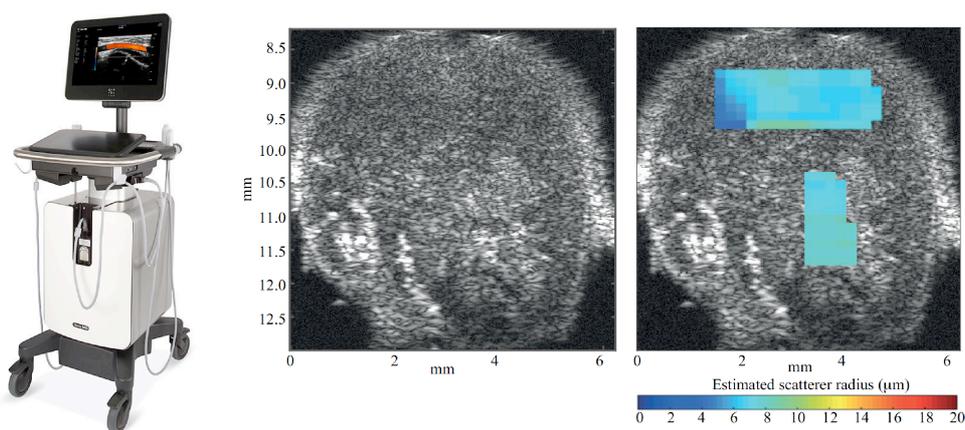
One year Post-Doctoral Position: High frequency quantitative ultrasound techniques for assessment of skin cancer in patients

Context and project: Non-invasive optical dermoscopy techniques (such as optical coherence tomography, confocal microscopy) usually provide an etiological orientation of skin tumors. However, some benign lesions are of uncertain diagnosis and require systematic removal. The limited depth of field of these techniques does not allow an analysis of the lesion geometry or their histological subtypes, which remain the prerogative of histology. These limitations are penalizing in the initial diagnostic strategy but especially in the therapeutic strategy requiring a two-step resection with a second look to widen the margins of the initial excision.

The objective of the project will be to investigate the ability of high frequency (up to 60 MHz) of Quantitative Ultrasound (QUS) techniques to diagnose skin cancer (basal cell carcinomas and malignant melanomas). The RF data collection will be performed using the VevoMD Visualsonics by trained radiologists at the CHU-university hospital of Nice on patients with suspicious cancer lesions. The candidate will work with the ultrasonic group of Laboratory of Mechanics and Acoustics (LMA CNRS UMR 7031), specialist in QUS techniques based on backscatter coefficient analysis to characterize tissue microstructure (scatterer size, acoustic concentration, spatial organization). The candidate will adapt and validate the reference phantom technique for measuring reliable backscatter coefficient with the high frequency echographic system Vevo MD, perform the QUS analysis of RF data and study the correlation between QUS parameters and histological observations.

Practical information: The post-doc position is funded for one year and should start before October 2020 at the latest. The recruited post-doc will be co-advised by Emilie Franceschini (LMA-Laboratory of Mechanics and Acoustics, Marseille) and Charles Raffaelli (CHU-university hospital of Nice).

How to apply: The candidate should have a PhD (or have it completed before the start of the position) in a relevant field, and strong knowledge in the field of quantitative ultrasound and experience with ultrasound instrumentation. To apply, please send a curriculum vitae to franceschini@lma.cnrs-mrs.fr and charles.raffaelli@univ-cotedazur.fr



Quantitative images using the theoretical US scattering model named the structure factor model for a heterogeneous tumor superimposed on the gray-scale B-mode image
(Figure from Muleki et al., *IEEE UFFC* 23, pp. 1335-1350, 2016)