# Large area mapping of biophysical properties in tissue sections and cancer cells by scanning probe microscopy (SPM)

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Illnesses can be described in terms of changes in the biophysical properties of cells and tissues, like the elasticity and the electric charge. Mechanic and dielectric properties thus can give useful information for diagnostics and therapeutics. In SPM, the dielectric imaging has been relatively less studied compared to the mechanical imaging, nevertheless its high sensitivity makes it a valuable addition to the standard force volume-based mechanical mapping. The objective of this research is to distinguish cell phenotypes and areas in tissue sections with heterogeneous biochemical composition at the microscale using simultaneous mechanic and dielectric mapping with SPM. This research aims to bring the SPM from the basic research and the exploration of few sample areas of nanometer-size materials to the clinical contest, where big datasets are required for statistics. This implies testing many patients and scanning millimeter-size areas of the sample. Such data can be employed in correlative analysis using other biomedical imaging techniques and analytic techniques.

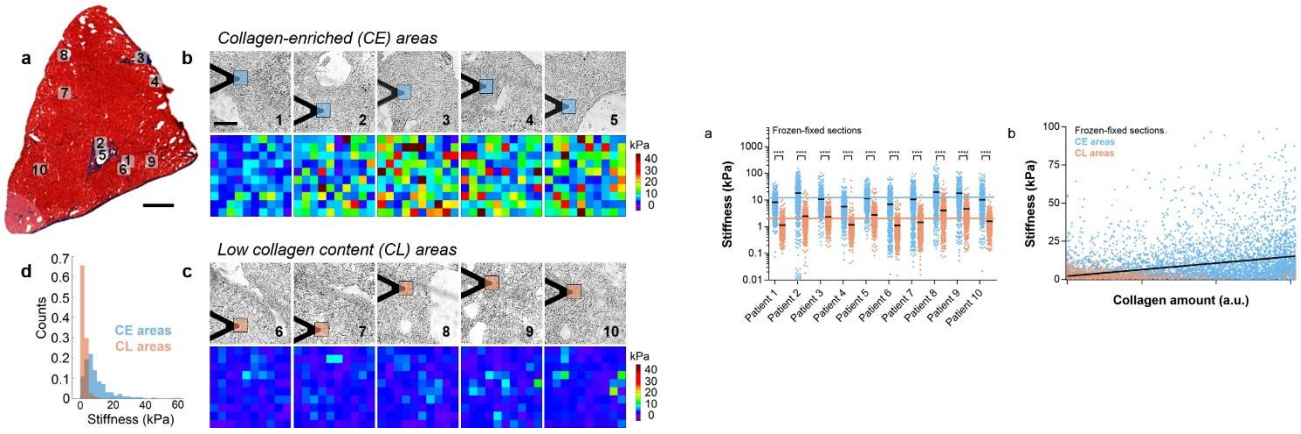


Fig. 1. Spatial mapping of the collagen distribution in human and mouse tissues by force volume atomic force microscopy

References:

[1] A. Calò, Y. Romin, R. Srouji, C. P. Zambirinis, N. Fan, A. Santella, E. Feng, S. Fujisawa, M. Turkekul, S. Huang, A. L. Simpson, M. D'Angelica, W. R. Jarnagin, K. Manova-Todorova. Sci. Rep. 10, 15664 (2020).