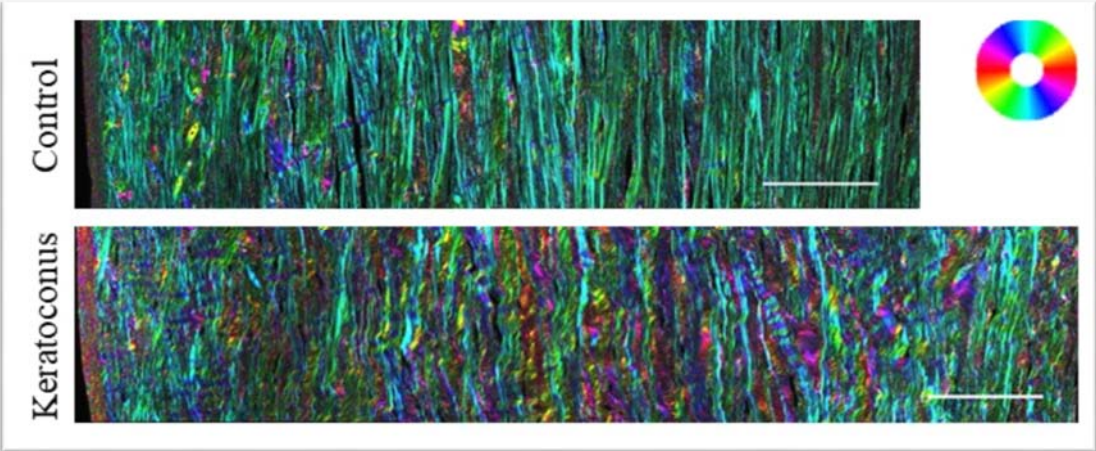


Title : Structural imaging of healthy and pathological tissues using multiphoton microscopy.		
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Webpage : https://portail.polytechnique.edu/lob/fr/recherche/microscopies-avancees/second-harmonic-generation-skin-and-cornea		
Research Area : Biophysics, Optics		
Methods : Polarimetric multiphoton microscopy based on the following nonlinear optical processes : polarization-resolved second harmonic generation (P-SHG), 2-photon excited fluorescence (2PEF)		
PhD track subject : Second harmonic generation (SHG) is a coherent nonlinear optical process that is specific for non-centrosymmetrical materials and accordingly reveals fibrillary collagen in biological tissues. SHG microscopy is thus the gold standard for structural imaging of this biomolecule, which is a crucial building block of all organs (vessels, skin, bone, lung...). The project aims at implementing advanced polarization-resolved SHG analyses to probe the 3D multiscale organization of collagen in complex tissues and to evidence collagen remodeling towards more disordered distributions during pathologies.		
		
<p><i>Figure 1: Collagen orientation maps of healthy (top) and pathological (bottom) corneas. The color codes for the collagen orientation obtained from P-SHG, the saturation for the R^2 coefficient of determination and the brightness for the SHG intensity (HSV look-up-table). Scale bars: 100 μm.</i></p>		
References :		
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