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Sommario/riassunto	The master thesis of Johanna Maria Ticar reveals high-resolution insights into the myocardial microstructure and illustrates that cardiac muscle fibers are straight, running in parallel with one preferred fiber direction, however, deposits such as fat seem to compromise the regular and compact structure. Second harmonic generation imaging combined with optical tissue clearing is an accurate method for determining the three-dimensional muscle fiber and sheet orientations and hence, allows the calculation of fiber rotation throughout the ventricle wall. Contents Structure of the Human Myocardium Imaging Tools for Fiber Mapping Optical Tissue Clearing Second Harmonic Generation Imaging 3D Reconstruction and Visualization

Target Groups Researchers and Students in the field of Biomedical Engineering with a focus on Bioengineering and Biomechanics Professionals in the field of Biomedicine The Author Johanna Maria Ticar, MSc, studied Biomedical Engineering at Graz University of Technology. Her research interests are the microstructure of the human body, tissue engineering and regenerative medicine, foremost in the field of cardiology.