

# Methods for automatic processing and analysis of orthotropic biological structures by microscopy and computed tomography

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## Abstract

© 2016, International Journal of Pharmacy and Technology. All rights reserved. Image acquisition and analysis is a key moment in the biological research and diagnostics. In practice, the evidence-based medicine and biology have to deal with large arrays of image data. Automating these data processing is a relevant task. This paper presents a software package that performs automated processing of biological objects with a pronounced orthotropy. As well as the results of such data processing for two-dimensional setting - analysis of the structure of the skin and muscles, as well as for three-dimensional analysis - processing of bone tissue tomograms. To analyze the properties of orthotropy, we used a mathematical apparatus designed on the basis of anisotropic tensor, the use of which ensures estimation of the averaged direction of the periodic structure in the plane or space, their frequency and the filling density. The versatility and availability of automated mode ensures significant acceleration of data processing and improves the quality of the results.

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## Keywords

Anisotropic tensor, Biomechanics, Image analysis, Orthotropic biological structures, Process automation