

## An Inquiry on Imaging of Soft Tissues in Micro-Computed Tomography

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**Abstract :** Introduction: Micro-CT is well used for examination of bone structures and teeth. On the other hand visualization of the soft tissues is still limited. The goal of our study was to elaborate methodology for soft tissue samples imaging in micro-CT. Methodology: We used organs of rats and mice. We either did a preparation of the organs and fixation in contrast solution or we did cannulation of blood vessels and their injection for imaging of the vascular system. First, we scanned native specimens, then we created corrosive specimens by resins. In the next step, we injected vascular system either by Aurovist contrast agent or by Exitron. In the next step, we focused on soft tissues contrast increase. We scanned samples fixated in Lugol solution, samples fixated in pure ethanol and in formaldehyde solution. All used methods were afterwards compared. Results: Native specimens did not provide sufficient contrast of the tissues in any of organs. Corrosive samples of the blood stream provided great contrast and details; on the other hand, it was necessary to destroy the organ. Further examined possibility was injection of the AuroVist contrast that leads to the great bloodstream contrast. Injection of Exitron contrast agent comparing to Aurovist did not provide such a great contrast. The soft tissues (kidney, heart, lungs, brain, and liver) were best visualized after fixation in ethanol. This type of fixation showed best results in all studied tissues. Lugol solution had great results in muscle tissue. Fixation by formaldehyde solution showed similar quality of contrast in the tissues like ethanol. Conclusion: Before imaging, we need to, first, determinate which structures of the soft tissues we want to visualize. In the case of the bloodstream, the best was AuroVist and corrosive specimens. Muscle tissue is best visualized by Lugol solution. In the case of the organs containing cavities, like kidneys or brain, the best way was ethanol fixation.

**Keywords :** experimental imaging, fixation, micro-CT, soft tissues

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