

Micro-CT journey - from bones to personalized medicine

Monday, 11 October 2021 09:40 (20 minutes)

X-ray microtomography (micro-CT) is a well established nondestructive 3D method for small sample internal structure imaging. For over 20 years, micro-CT is known as a golden standard in bone microarchitecture analysis, as an alternative to histological sectioning method for preclinical research [1, 2]. Micro-CT surpasses histological analysis because it provides 3D information with several micron sampling.

In recent years, micro-CT has been successfully used in micro-angiography research. For this purpose it needs addition of contrast agents either by staining the sample for ex-vivo scanning or using perfusion in small animal in-vivo micro-CT [3, 4]. Staining methods enhance imaging contrast globally by diffusion process in examined tissue, particularly in areas with high affinity to a specific contrasting solutions. Recent research proves the potential of this method in imaging of 3D cell cultures called spheroids [5]. The injected contrast agent works more locally. It can enhance image contrast of blood vessels, heart, kidneys and urinary bladder.

From the other hand micro-CT is an indispensable tool in material science including drug design for a personalized medicine. This work shows how micro-CT can help in design and quality control of individual 3D printed tablets [6, 7].

References

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Session Classification: Monday Morning Session