Innovation with Integrity

BRUKER MICRO-CT ACADEMY

Volume 3, Issue 7, July 2016

Bruker microCT
Kartuizersweg 3B
B-2550 Kontich, Belgium
Tel: +32 (0)3 877 5705
Fax: +32 (0)3 877 5769
applications.BmCT@bruker.com
www.bruker-microCT.com

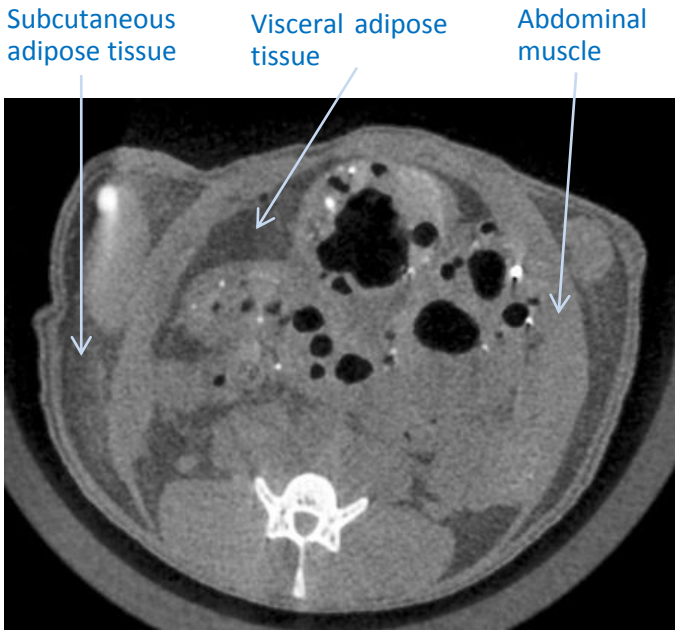
In this issue:

Welcome

This month's issue will focus on the quantification of adipose tissue *in vivo* in mice or rats using the SkyScan 1278 microCT system.

Quantification of adipose tissue

It is becoming increasingly important to assess the amount of adipose tissue (fat) in animals in order to characterize its role in not only obesity, but also various metabolic disorders such as insulin resistance, type 2 diabetes, or cardiovascular diseases. *In vivo* microCT is a non-invasive technique that allows for repeated measurements in the same animal, making it possible to follow disease progression and treatment effect in a longitudinal manner. Adipose tissue is composed mostly of adipocytes and its role is to store energy in the form of lipids.



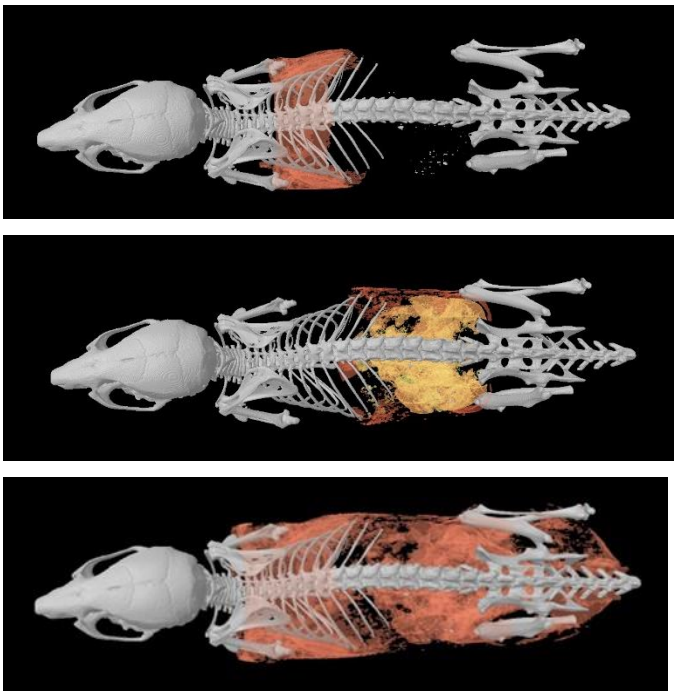
Reconstructed cross-section through the abdomen of a mouse with the discrimination between subcutaneous and visceral adipose tissue, scanned by Skyscan 1278.

Because these lipids have a chain of carbon atoms, there will be a density difference with the surrounding soft tissue such as the abdominal muscle. This makes it possible to determine the amount of adipose tissue without the use of a contrast agent. Adipose tissue is generally distributed into two main compartments, immediately under the skin on top of the abdominal muscle (subcutaneous adipose tissue) and in the body cavity between the organs (visceral adipose tissue).

With microCT it is not only possible to determine the total amount of adipose tissue, but also discriminate between subcutaneaous and visceral adipose tissue. In this newsletter, we discuss different approaches to quantify different adipose tissue depots. For the analysis of subcutaneous adipose tissue, visceral and subcutaneous adipose tissue, and whole body adipose tissue, we refer to:

"*MN090 Quantifying subcutaneous adipose tissue in the thorax region of a mouse or rat by in vivo microCT using the SkyScan 1278*", "*MN091 Quantifying visceral and subcutaneous adipose tissue in the abdominal region of a mouse or rat by in vivo microCT using the Skyscan 1278*", and "*MN092 Quantifying total adipose tissue throughout the body in a mouse or rat by in vivo microCT using the SkyScan 1278*", respectively.

Each method note explains step by step how to quantify the amount of adipose tissue, determine the thickness distribution, and make 3D models of the adipose tissue on top of the skeletal structure.



Surface rendered model of adipose tissue in the thorax region (top), abdominal region with the visceral adipose tissue in yellow (middle), and whole body (bottom) on top of the skeletal structure.

Bruker microCT News

We invite you to attend a webinar on August 3rd on *bone imaging and analysis*. This webinar will cover the basics of microCT technology and give an overview of the possibilities of microCT in bone imaging and analysis. Register here!

Upcoming events

Bruker microCT will participate with an exhibit in the forthcoming conferences. Please click the link below for more information. We hope to see you there!

XRM	Aug. 15 – 19	Oxford, UK
ICXRI	Aug. 17 – 18	Putra Jaya, Malaysia
IGC	Aug. 27 – Sep. 02	Cape Town, South Africa
JASIS	Sep. 06 – 09	Chiba, Japan
WMIC	Sep. 07 – 10	New York, USA
ASBMR	Sep. 16 – 19	Atlanta, USA
ICE	Sep. 25 – 30	Florida, USA
IASLC	Dec. 04 – 07	Vienna, Austria

Image of the Month

The surprising structure of sea ice. Salt dissolved in sea water gets concentrated in cracks when the water freezes, creating a patch work of pure ice, salt and air bubbles. Scanned using SkyScan 1174, pixel size of 29 µm, rendered with CTVox.