SkyScan 1276

High resolution in vivo microCT
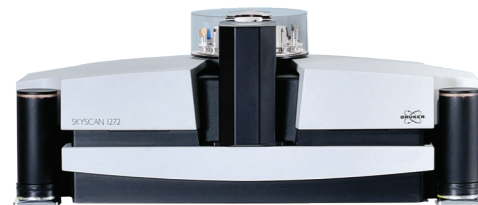
X-ray source	20-100kV, 20W, <5µm spot size @ 4W
X-ray detector	11Mp, 14-bit cooled CCD
Scanning space	80mm diameter, >300mm in length
Spatial resolution	2.8µm smallest pixel size, 5-8µm details resolved with more than 10% contrast
Reconstruction	Heirarchical (InstaRecon®) and multithreaded CPU/GPU 3D reconstruction

Dedicated software package for acquisition, reconstruction, dataviewing, 3D modeling and image analysis

SkyScan 1272

High resolution ex vivo microCT

X-ray source	20-100kV, 10W, <5µm spot size @ 4W
X-ray detector	16Mp or 11Mp, 14-bit cooled CCD
Maximum object size	75mm in diameter, 70mm high
Reconstruction	Heirarchical (InstaRecon®) and multithreaded CPU/GPU 3D reconstruction
Detail detectability	0.35µm (16Mp) or 0.45µm (11Mp) smallest pixel size

Dedicated software package for acquisition, reconstruction, dataviewing, 3D modeling and image analysis

SkyScan 1275

High throughput ex vivo microCT
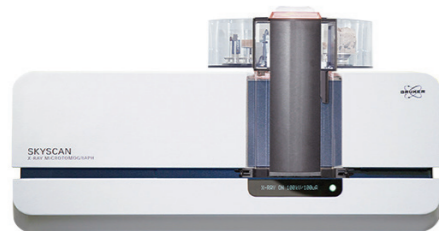
X-ray source	20-100kV, 10W, <5µm spot size @ 4W
X-ray detector	3Mp active pixel CMOS flat panel
Maximum object size	96mm in diameter, 120mm high
Detail detectability	4µm smallest pixel size
Reconstruction	Multithreaded CPU/GPU 3D reconstructions

Dedicated software package for acquisition, reconstruction, dataviewing, 3D modeling and image analysis
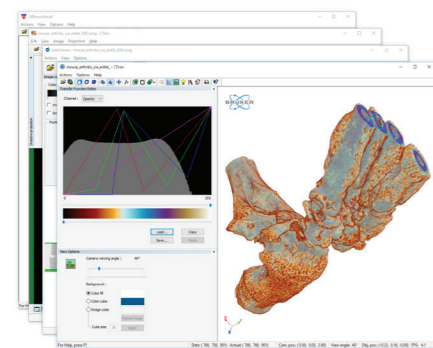
A universal software solution to microCT bone morphometry and micro-densitometry.

- 3D orientation adjustment
- Flexible volume-of-interest delineation
- Powerful segmentation techniques
- Comprehensive 3D morphometry
- Calibrated densitometry of BMD/BMC
- 3D registration
- Multiple 3D rendering options
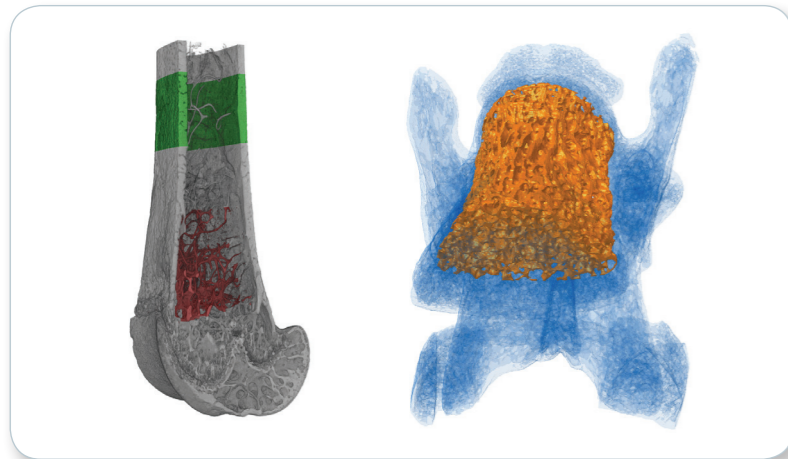- DICOM input and output

● **Bruker BioSpin**

info@bruker.com
www.bruker.com
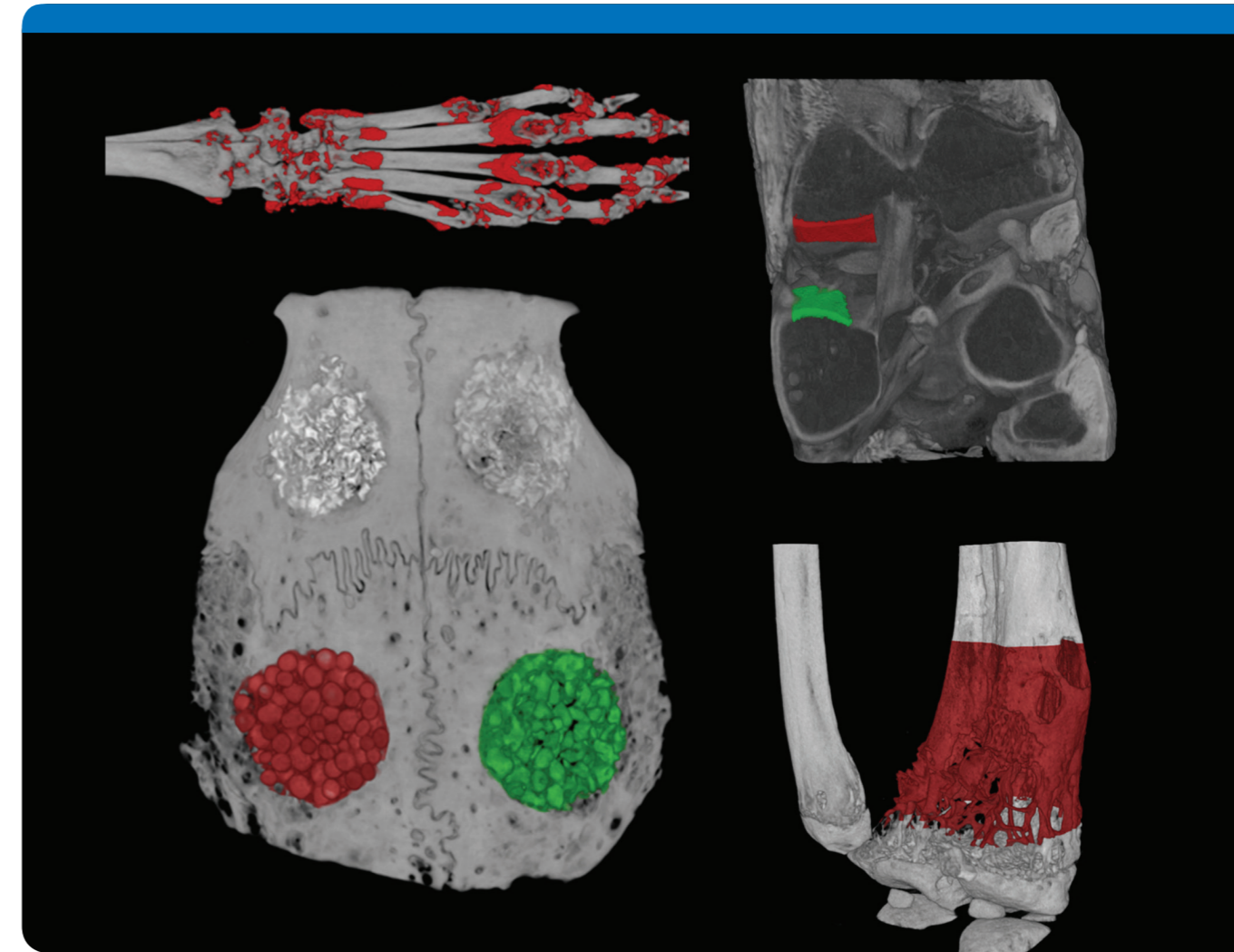
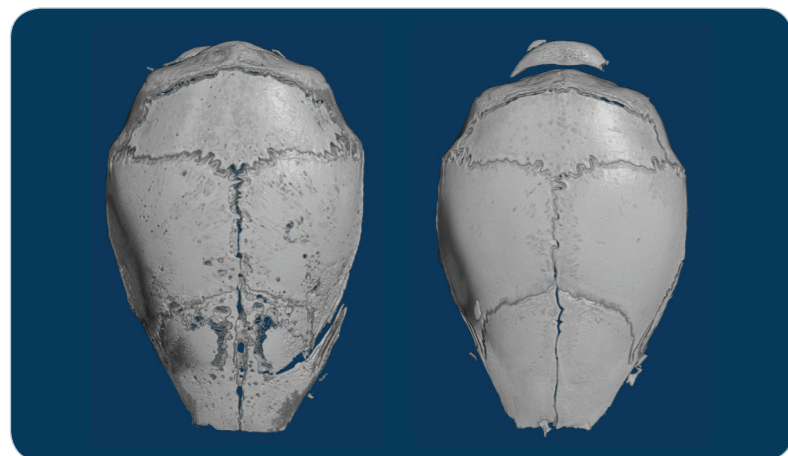# Preclinical Imaging of Bone Disease Models

● High Resolution microCT

Innovation with Integrity

Microtomography

State-of-the-Art microCT Imaging

State-of-the-art microCT imaging in vivo and ex vivo is accompanied by the industry-benchmark 3D software suite for reconstruction and analysis.
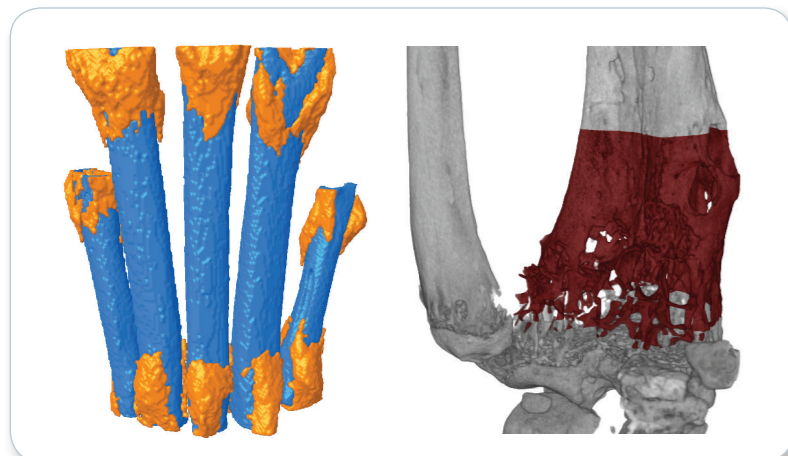
- Trabecular and cortical volume of interest (VOI) selection
- BMD / BMC with calibration
- Osteoporosis
- Growth trajectories
- Genetic differences

Trabecular and cortical VOIs in mouse femur and vertebra (SkyScan 1272, 1275 resp.).

Mouse and Rat Skull Bone Models

- Suture connection in development
- Defect repair with biomaterials
- Drug treatment responses
- Genetic differences
- Formation assessed from calvarial 3D thickness

Thinning in parietal and frontal bones of a KO mouse (left) compared to WT (right). Imaged using the SkyScan 1272.

Disease Models of Bone Disruption, Powerfully Imaged and Quantified

- Osteo-arthritis, rheumatoid arthritis
- Bone tumor metastasis, myeloma
- Osteolysis (loss of bone)
- Periosteal reaction ("roughage", or new pathological structures)
- FOP, Pagets, other gene disorders

Arthritis periosteal reaction on mouse tarsals (SkyScan 1276 in vivo), tumour osteolysis in a mouse femur (SkyScan 1272).

Cartilage Analysis

Cartilage 3D analysis following imaging by contrast staining eg phosphotungstic acid, Lugol's iodine:

- Standardised cartilage VOIs
- Cartilage thickness map
- Damage assessment
- Large animal subchondral cores, small animal joints
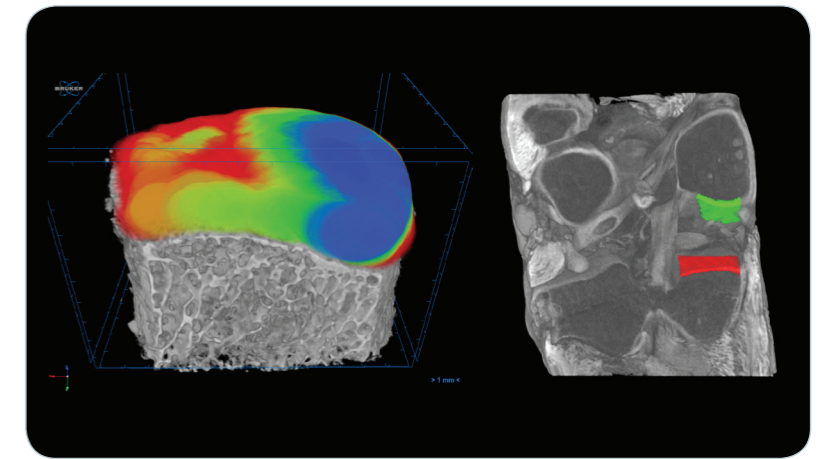
Human osteochondral core (no stain, humid chamber); mouse knee, PTA (SkyScan 1272).

## Bone Fracture Callus Healing Models

- Critical point defect
- Defect repair with biomaterials
- Precise and consistent VOI localization within defect
- Quantification of new bone formation
- Callus segmentation
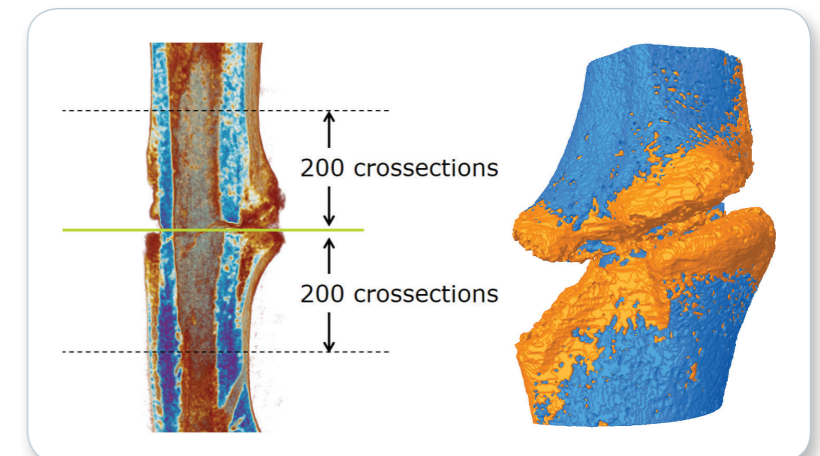
Rat midfemoral guillotine fracture, 2 weeks post-FX (SkyScan 1174): VOI defined relative to fracture midline.

Submicron Imaging of Bone Porosity

- Osteocyte lacunar morphology
- Osteocyte lacunar separation
- Vascular network
- Orientation and anisotropy
- Biomechanical responses
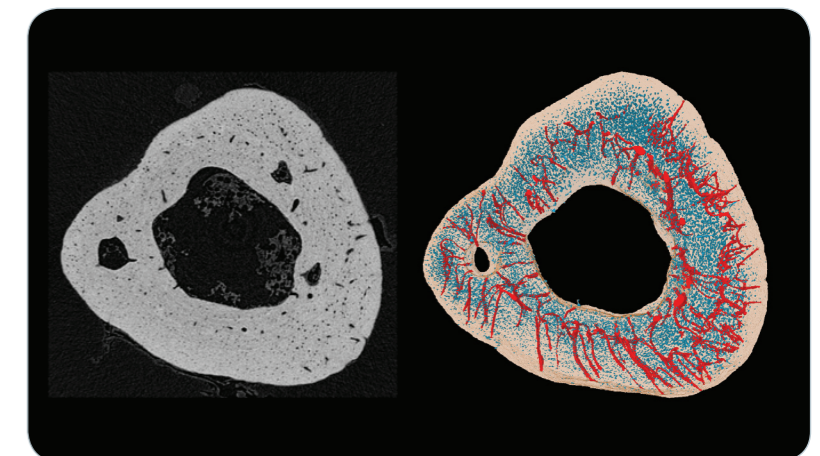
Mouse distal tibia, voxel size 600nm (SkyScan 1272) for analysis of osteocyte lacunae and blood vessel canals.