

Human proximal femur nanoCT imaging protocol

Please reference the nanoCT Core (RRID: SCR_026772) when using this protocol. Current as of 7/1/26. This protocol is subject to change. We hold no responsibility for errors in the protocol or user error that lead to personal or property damage.

Safety considerations

Please follow all federal, local and institutional rules and regulations when using this protocol. Use universal precautions when working with human tissue.

Human proximal femur nanoCT imaging protocol

Depending on the imaging system you use, you may need to alter this protocol. We use a phoenix nanotom M. This protocol is our standard for imaging intact human proximal femurs. To prepare the femur, we cut the bone 3.5 inches distal from the center of the lesser trochanter. The distal part of the proximal femur is potted in polymethmethacrylate.

Materials:

Proximal femur fixture/humidity chamber
Hydroxyapatite and acrylic standard with foam spacer
Zip ties



Figure 1. Clear representation of proximal femur fixture/humidity chamber. Our current fixture is opaque.

Specimen set-up: Secure the potted proximal femur in the receiver on the lid. Place the foam spacer along the bone, distal to the lesser trochanter and hold the standards on the opposing side, securing with a zip tie. Cut excess length from the zip tie, invert the lid and femur over the chamber, and press into place.

System Settings:

Voltage: 110kV

Current: 200 μ A

Mode: 0

Exposure time: 500ms

Images averaged: 3

Images skipped: 1

Target type: Diamond-coated tungsten

Voxel size: 27 μ (specimen position 162mm, detector position 600mm)

Filter: 0.762mm Aluminum

Virtual Sensor: 2

Detector shift: On

Number of images: 1000

Notes: Multiscan mode is needed to include the entire proximal femur. Set the first position to include the femoral head above the image crosshair. If it is too low, part of the femoral head will get cut off during reconstruction, due to stitching algorithms. Ensure that the most distal part of the proximal femur is below the image crosshair in the last position before completing the multiscan.