

Center for Musculoskeletal Research

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Imaging & Biomechanical Testing Core

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Imaging and Biomechanical Core Services and Policies

Service	Description
<p>Mouse long bones microCT</p>	<p>Billing: A flat fee is charged per bone (please see fee schedule). The flat fee includes the following:</p> <ul style="list-style-type: none"> - Metaphyseal region scan (10-12 μm resolution) for trabecular evaluation - Mid-diaphysis scan (10-12 μm resolution) for cortical evaluation - Image reconstruction - Standard sample analysis <p><u>The parameters that are typically reported for long bones include:</u></p> <p><i>Trabecular parameters:</i></p> <ul style="list-style-type: none"> - BV/TV (%) - Ratio of bone volume to total volume in the metaphysis - Tb.Th (mm) - Average thickness of individual trabeculae - Tb.N (mm^{-1}) - Number of trabeculae per mm of bone - Tb.Sp (μm) - Average distance separating individual trabeculae - Conn.D (mm^{-3}) - Density of trabecular intricacies per mm^3 of bone <p><i>Cortical Parameters:</i></p> <ul style="list-style-type: none"> - Ct.Th (μm) - Average thickness of the cortical shell - Ct. TMD (mgHA/cm^3) - Mean cortical bone mineral density - Ct.Ar (mm^2) - Average area of the cortical bone in each cross-section - Tt.Ar (mm^2) - Average total cross-sectional area (bone and non-bone) - Ma.Ar (mm^2) - Average medullary area (Tt.Ar - Ct.Ar) - Ct.Ar/Tt.Ar (%) - Relative cortical bone area - pMOI (mm^4) - Polar moment of inertia <p><u>The following will be given to you upon completion of the project:</u></p> <ul style="list-style-type: none"> - Data will be provided in an Excel spreadsheet - Standard images of scanned regions (slice images) - We will provide assistance with writing methods for publications - Upon request we can provide DVDs with DICOMs for your scans (extra fee applies) - Non-standard images will be produced at the hourly consultation rate

Services (cont.):

Service	Description
<p>Mouse Vertebrae microCT</p>	<p>Billing: A flat fee is charged per bone (please see fee schedule). The flat fee includes the following:</p> <ul style="list-style-type: none"> - Scan of the vertebral body (12 μm resolution) for trabecular evaluation - Image reconstruction - Standard sample analysis <p><u>The parameters that are typically reported for vertebrae include:</u></p> <ul style="list-style-type: none"> - The same trabecular parameters that are reported for mouse long bones (see above) <p><u>The following will be given to you upon completion of the project:</u></p> <ul style="list-style-type: none"> - Data will be provided in an Excel spreadsheet - Standard representative slice images of scanned regions - We will provide assistance with writing methods for publications - Upon request we can provide DVDs with DICOMs for your scans (extra fee applies) - Non-standard images will be produced at the hourly consultation rate
<p>Consultation and Custom microCT analysis (all scans other than standard mouse long bone and vertebral scans)</p>	<p>Billing: Projects are billed based on microCT machine time and technician time. The hourly consultation rate is charged for machine time and technician time (please see fee schedule). Prior to starting your project we will give you an estimate of what the cost will be to scan and analyze each sample.</p> <p><u>Available options include:</u></p> <ul style="list-style-type: none"> - We can give you the data (DICOMs, TIFFs, etc.) and you can analyze it yourself - Generation of images or videos for publications and presentations - Custom quantification of client defined parameters - Consultation on results and study design - Many other options are available!
<p>Osmium tetroxide (OT) staining and μCT scanning of marrow adipose tissue</p>	<p>Billing: A flat fee is charged per bone. The rate charged per bone is 4 units of Custom Analysis (please see fee schedule).</p> <p>This service includes the following:</p> <ul style="list-style-type: none"> - Full bone scans of both the mineralized and demineralized (OT stained) tibia - Standard trabecular and cortical bone analysis - Demineralization and OT staining of samples - Quantification of the adipose staining within a portion of the marrow cavity - Representative images of the mineralized and OT stained samples

Services (cont.):

Service	Description
PIXImus scanning	Billing: Users are charged the hourly PIXImus scanning rate (please see fee schedule) for using the PIXImus machine. Users are required to demonstrate knowledge on the use of the PIXImus machine prior to use. Training is available and is billed at the hourly consultation rate.
Mechanical testing (Performed at BIDMC)	<p>Billing: A per specimen fee is charged for the testing of each specimen. Additionally, a mechanical testing project setup fee is charged for each project.</p> <p>Equipment:</p> <ul style="list-style-type: none"> - Bose ElectroForce (Axial-torsional) - Instron 8511 (Axial) - Biodent (Reference point indentation) <p>Types of testing:</p> <ul style="list-style-type: none"> - Three or four-point bending (Spans from 10mm to 150mm) - Torsional tests (torques from 0.2Nm to 225 Nm) - Tension and compression tests (1N to 25kN) - Reference point indentation - Custom tests
Micro-Finite Element Analysis (mFE)	<p>Billing: A fixed fee is charged for performing the analysis of each specimen. The fee for mFE analysis is in addition to the fees for performing the μCT scanning of the bone to generate the scan data for creating the μFE model.</p> <p>Types of analysis:</p> <ul style="list-style-type: none"> - μFE modeling of compression test of mouse and rat vertebrae - μFE modeling of compression test of metaphyseal region of long bones

Policies:

Analysis timeframe:

In general we begin projects in the order in which they are received. If you have time sensitive samples or specific deadlines we will do our best to work with you. Once you submit a requisition form, we will give you an estimate of when we will be able to complete your project.

Specimen preparation:

Unless prior arrangements have been made, specimens should be delivered to the core ready for scanning (please refer to the *Preparation of Samples for μ CT Scanning* protocol on the Imaging and Biomechanical Core website). The hourly consultation rate will be charged if it is necessary for our technician to dissect your samples prior to scanning.

Data backup:

After the completion of your project, the data from your scans is backed up to two separate data storage tapes. Additionally, if you would like to secure the data yourself, we can copy your scans to an external hard drive that you provide. The technician time required to copy the data to your external hard drive is billed at the hourly consultation rate.