X-ray IMPC_XRY_001

Purpose

Construct and analyse digital X-ray images in immobilised mice using a Faxitron X-Ray system or NTB digital X-ray scanner.

Experimental Design

- Minimum number of animals: 4M + 4F
- Age at test: Week 14

Procedure

Perform steps 3.1 and 3.2 unless the mouse is coming from DEXA analysis

3.1 Anesthetize the mice.

3.2 Monitor the animal carefully until unconsciousness by ensuring the mouse is adequately sedated.

3.3 Mount the anesthetized mouse onto an X-ray permeable plate. Curve the tail along the left side of the mouse. (Note: this will enable identification of the X-ray as a dorsal or ventral image.)

Faxitron X-ray system

3.3.1 Insert the plate into the Faxitron X-ray system.

3.3.2 Take an image using the software that is supplied by the X-ray scanner.

3.3.3 Set the machine to a voltage of 25kV with an integration time of 40ms.

3.3.4 Take an image using the iX-Pect software that is supplied by the X-ray scanner.

NTB digital X-ray scanner

3.4 Remove the mouse once the image is captured. Place the mouse on a heated mat, set at 37°C, in a cage and monitor closely until consciousness is fully regained.

3.5 Analyze the image.

3.6 Or continue with ABR.
Notes

The protocol described herein employs anaesthesia using intraperitoneal (IP) administration; however, anaesthesia using isoflurane is also suitable.

**Digit integrity IMPC_XRY_031_001**  
*Definition:* The state of being whole and undivided.

**Parameters and Metadata**

**Skull shape** IMPC_XRY_001_001 | v1.0

*simpleParameter*

- **Req. Analysis:** false  
- **Req. Upload:** true  
- **Is Annotated:** true

*Description:* skull_shape

*Options:* imageOnly, normal, abnormal, unobservable,

**Zygomatic bone** IMPC_XRY_002_001 | v1.0

*simpleParameter*

- **Req. Analysis:** false  
- **Req. Upload:** true  
- **Is Annotated:** true

*Description:* zygomatic_bone

*Options:* imageOnly, normal, abnormal, unobservable,

**Maxilla/Pre-maxilla** IMPC_XRY_003_001 | v1.1

*simpleParameter*
Description: maxilla

Options: imageOnly, normal, abnormal, unobservable,

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**Mandibles** IMPC_XRY_004_001 | v1.0

Description: mandibles

Options: imageOnly, normal, abnormal, unobservable,

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**Teeth** IMPC_XRY_005_001 | v1.0

Description: teeth

Options: imageOnly, normal, abnormal, unobservable,

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**Scapulae** IMPC_XRY_006_001 | v1.0
simpleParameter


Description: scapulae

Options: imageOnly, normal, abnormal, unobservable,

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**Clavicle** IMPC_XRY_007_001 | v1.0

simpleParameter


Description: clavicle

Options: imageOnly, normal, abnormal, unobservable,

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**Number of ribs right** IMPC_XRY_008_001 | v1.0

simpleParameter


Description: number_of_ribs_right

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**Number of ribs left** IMPC_XRY_009_001 | v1.0

simpleParameter
Shape of ribs IMPC_XRY_010_001 | v1.0

Description: shape_of_ribs
Options: imageOnly, normal, abnormal, unobservable,

Fusion of ribs IMPC_XRY_011_001 | v1.0

Description: fusion_of_ribs
Options: imageOnly, fused, not fused, unobservable,
Description: pelvis

Options: imageOnly, normal, abnormal, unobservable,

Number of cervical vertebrae IMPC_XRY_013_001 | v1.0

Description: number_of_cervical_vertebrae

Number of thoracic vertebrae IMPC_XRY_014_001 | v1.0

Description: number_of_thoracic_vertebrae

Number of lumbar vertebrae IMPC_XRY_015_001 | v1.0
**Description:** number_of_lumbar_vertebrae

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**Number of pelvic vertebrae**  IMPC_XRY_016_001 | v1.0  
simpleParameter

**Req. Analysis:** false  
**Req. Upload:** false  
**Is Annotated:** true

**Description:** number_of_pelvic_vertebrae

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**Number of caudal vertebrae**  IMPC_XRY_017_001 | v1.1  
simpleParameter

**Req. Analysis:** false  
**Req. Upload:** false  
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**Description:** number_of_caudal_vertebrae

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**Shape of vertebrae**  IMPC_XRY_018_001 | v1.0  
simpleParameter

**Req. Analysis:** false  
**Req. Upload:** true  
**Is Annotated:** true

**Description:** shape_of_vertebrae

**Options:** imageOnly, normal, abnormal, unobservable,
**Fusion of vertebrae**  IMPC_XRY_019_001 | v1.0
simpleParameter

**Req. Analysis:** false  **Req. Upload:** true  **Is Annotated:** true

**Description:** fusion_of_vertebrae

**Options:** imageOnly, yes, no, unobservable,

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**Processes on vertebrae**  IMPC_XRY_020_001 | v1.0
simpleParameter

**Req. Analysis:** false  **Req. Upload:** true  **Is Annotated:** true

**Description:** processes_on_vertebrae

**Options:** imageOnly, normal, abnormal, unobservable,

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**Humerus**  IMPC_XRY_021_001 | v1.0
simpleParameter

**Req. Analysis:** false  **Req. Upload:** true  **Is Annotated:** true

**Description:** humerus

**Options:** imageOnly, normal, abnormal, unobservable,
**Radius** IMPC_XRY_022_001 | v1.0

simpleParameter

**Description:** radius

**Options:** imageOnly, normal, abnormal, unobservable,

**Ulna** IMPC_XRY_023_001 | v1.0

simpleParameter

**Description:** ulna

**Options:** imageOnly, normal, abnormal, unobservable,

**Femur** IMPC_XRY_024_001 | v1.0

simpleParameter

**Description:** femur

**Options:** imageOnly, normal, abnormal, unobservable,
**Tibia** IMPC_XRY_025_001 | v1.0

**simpleParameter**

**Req. Analysis:** false  
**Req. Upload:** true  
**Is Annotated:** true

**Description:** tibia

**Options:** imageOnly, normal, abnormal, unobservable,

**Fibula** IMPC_XRY_026_001 | v1.0

**simpleParameter**

**Req. Analysis:** false  
**Req. Upload:** true  
**Is Annotated:** true

**Description:** fibula

**Options:** imageOnly, normal, abnormal, unobservable,

**Joints** IMPC_XRY_027_001 | v1.0

**simpleParameter**

**Req. Analysis:** false  
**Req. Upload:** true  
**Is Annotated:** true

**Description:** joints

**Options:** imageOnly, normal, abnormal, unobservable,
**Number of digits** IMPC_XRY_028_001 | v1.0

*simpleParameter*

Req. Analysis: false  
Req. Upload: false  
Is Annotated: true

Description: number_of_digits

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**Syndactylism** IMPC_XRY_029_001 | v1.0

*simpleParameter*

Req. Analysis: false  
Req. Upload: true  
Is Annotated: true

Description: syndactylism

Options: imageOnly, Syndactylism, no syndactylism, unobservable,

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**Brachydactyly** IMPC_XRY_030_001 | v1.1

*simpleParameter*

Req. Analysis: false  
Req. Upload: true  
Is Annotated: true

Description: completeness_of_digits

Options: imageOnly, yes, no, unobservable,
Digit integrity IMPC_XRY_031_001 | v1.0

simpleParameter

Description: digit_integrity

Options: imageOnly, yes, no, unobservable,

Comment on XRay image IMPC_XRY_032_001 | v1.1

simpleParameter

Description: comment_on_xray_image

Tibia length IMPC_XRY_033_001 | v1.1

simpleParameter

Unit Measured: mm

Description: tibia_length
XRay Images Whole Body Dorso Ventral IMPC_XRY_034_001 | v1.3


Description: xray_images

Increments: Minimum 1

Alive IMPC_XRY_035_001 | v1.0


Description: alive

Xray equipment ID IMPC_XRY_036_001 | v1.1


Description: xray_equipment_name
Xray equipment manufacturer IMPC_XRY_037_001 | v1.4
procedureMetadata


Description: xray_equipment_manufacturer

Options: Faxitron X-Ray Corporation, Rigaku Corporation (Micro-CT), Bruker, Faxitron Bioptics LLC,

Xray equipment model IMPC_XRY_038_001 | v1.4
procedureMetadata


Description: xray_equipment_model

Options: MX-20-DC12, MX-20-DC4, R_mCT (Micro-CT), MX-20, MS-FX Pro, UltraFocus 100, UltraFocus DXA, PathVision,

Settings time of exposure IMPC_XRY_039_001 | v1.1
procedureMetadata


Unit Measured: s

Description: settings_time_of_exposure
**Settings level** IMPC_XRY_040_001 | v1.1

*procedureMetadata*

Req. Analysis: false  
Req. Upload: true  
Is Annotated: false

Description: settings_level

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**Experimenter ID (scan)** IMPC_XRY_041_001 | v1.1

*procedureMetadata*

Req. Analysis: false  
Req. Upload: true  
Is Annotated: false

Description: experimenter_scan_

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**Experimenter ID (analysis)** IMPC_XRY_042_001 | v1.1

*procedureMetadata*

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Req. Upload: true  
Is Annotated: false

Description: experimenter_analysis_

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**Voltage settings** IMPC_XRY_043_001 | v1.1

*procedureMetadata*
Description: voltage_settings

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Scanner equipment ID IMPC_XRY_044_001 | v1.1

Description: scanner_equipment_name

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Scanner equipment manufacturer IMPC_XRY_045_001 | v1.1

Description: scanner_equipment_manufacturer

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Scanner equipment model IMPC_XRY_046_001 | v1.1

Description: scanner_equipment_model
Date Xray equipment last calibrated IMPC_XRY_047_001 | v1.3

procedureMetadata


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**XRay Images Whole Body Lateral Orientation** IMPC_XRY_048_001 | v1.2

seriesMediaParameter


Increments: Minimum 1

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**XRay Images Forepaw** IMPC_XRY_049_001 | v1.1

seriesMediaParameter


Increments: Minimum 1

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**XRay Images Skull Lateral Orientation** IMPC_XRY_050_001 | v1.2
**XRay Images Skull Dorso Ventral Orientation**  IMPC_XRY_051_0

01 | v1.2

**XRay Images Hind Leg and Hip**  IMPC_XRY_052_001 | v1.1

**Date Scanner equipment last calibrated**  IMPC_XRY_053_001 | v1.1
**Free Ontology**  IMPC_XRY_054_001  |  v1.0  
simpleParameter

**Shape of spine**  IMPC_XRY_055_001  |  v1.1  
simpleParameter

**Scoliosis**  IMPC_XRY_056_001  |  v1.2  
simpleParameter

Options: normal, abnormal, imageOnly, unobservable,
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Fusion of processes  IMPC_XRY_061_001 | v1.1

Options: yes, no, imageOnly, unobservable,

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Polysyndactylism  IMPC_XRY_062_001 | v1.1

Options: yes, no, imageOnly, unobservable,

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Cervical processes  IMPC_XRY_063_001 | v1.1

Options: normal, abnormal, imageOnly, unobservable,
Thoracic processes  IMPC_XRY_064_001 | v1.1

simpleParameter


Options: normal, abnormal, imageOnly, unobservable,

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Lumbar processes  IMPC_XRY_065_001 | v1.1

simpleParameter


Options: normal, abnormal, imageOnly, unobservable,

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Sacral processes  IMPC_XRY_066_001 | v1.0

simpleParameter


Options: normal, abnormal, imageOnly, unobservable,

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Caudal processes  IMPC_XRY_067_001 | v1.0

simpleParameter
**Missing cranial rib**  IMPC_XRY_068_001 | v1.0

*simpleParameter*

**Rib morphology**  IMPC_XRY_069_001 | v1.0

*simpleParameter*

**Cervical vertebrae morphology**  IMPC_XRY_070_001 | v1.0

*simpleParameter*
**Thoracic vertebrae morphology**  IMPC_XRY_071_001 | v1.0

*simpleParameter*


Options: unobservable, imageOnly, normal, abnormal,

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**Lumbar vertebrae morphology**  IMPC_XRY_072_001 | v1.0

*simpleParameter*


Options: abnormal, normal, imageOnly, unobservable,

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**Pelvic vertebrae morphology**  IMPC_XRY_073_001 | v1.0

*simpleParameter*


Options: unobservable, abnormal, normal, imageOnly,
Caudal vertebrae morphology  IMPC_XRY_074_001 | v1.0

**simpleParameter**


Options: unobservable, abnormal, normal, imageOnly,