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


Description: skull_shape

Options: imageOnly, normal, abnormal, unobservable,

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**Zygomatic bone** IMPC_XRY_002_001 | v1.0

simpleParameter


Description: zygomatic_bone

Options: imageOnly, normal, abnormal, unobservable,

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**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,

Clavicle  IMPC_XRY_007_001 | v1.0

simpleParameter


Description: clavicle

Options: imageOnly, normal, abnormal, unobservable,

Number of ribs right  IMPC_XRY_008_001 | v1.0

simpleParameter


Description: number_of_ribs_right

Number of ribs left  IMPC_XRY_009_001 | v1.0

simpleParameter
**Shape of ribs** IMPC_XRY_010_001 | v1.0

*simpleParameter*

**Description:** number_of_ribs_left

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

**Fusion of ribs** IMPC_XRY_011_001 | v1.0

*simpleParameter*

**Description:** fusion_of_ribs

**Options:** imageOnly, fused, not fused, unobservable,

**Pelvis** IMPC_XRY_012_001 | v1.0

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

Description: number_of_pelvic_vertebrae

Number of caudal vertebrae  IMPC_XRY_017_001  | v1.1
simpleParameter

Description: number_of_caudal_vertebrae

Shape of vertebrae  IMPC_XRY_018_001  | v1.0
simpleParameter

Description: shape_of_vertebrae

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

simpleParameter


Description: fusion_of_vertebrae

Options: imageOnly, yes, no, unobservable,

Processes on vertebrae IMPC_XRY_020_001 | v1.0

simpleParameter


Description: processes_on_vertebrae

Options: imageOnly, normal, abnormal, unobservable,

Humerus IMPC_XRY_021_001 | v1.0

simpleParameter


Description: humerus

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

*simpleParameter*

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

**Description:** radius

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

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**Ulna** IMPC_XRY_023_001 | v1.0

*simpleParameter*

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

**Description:** ulna

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

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**Femur** IMPC_XRY_024_001 | v1.0

*simpleParameter*

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

**Description:** femur

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

simpleParameter


Description: tibia

Options: imageOnly, normal, abnormal, unobservable,

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**Fibula**  IMPC_XRY_026_001 | v1.0

simpleParameter


Description: fibula

Options: imageOnly, normal, abnormal, unobservable,

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**Joints**  IMPC_XRY_027_001 | v1.0

simpleParameter


Description: joints

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

simpleParameter


Description: number_of_digits

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**Syndactylism**  IMPC_XRY_029_001 | v1.0

simpleParameter


Description: syndactylism

Options: imageOnly, Syndactylism, no syndactylism, unobservable,

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**Brachydactyly**  IMPC_XRY_030_001 | v1.1

simpleParameter


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,

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**Comment on XRay image** IMPC_XRY_032_001 | v1.1

*simpleParameter*

**Description:** comment_on_xray_image

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**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

SeriesMediaParameter

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

**Description:** xray_images

**Increments:** Minimum 1

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**Alive**  IMPC_XRY_035_001 | v1.0

SimpleParameter

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

**Description:** alive

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**Xray equipment ID**  IMPC_XRY_036_001 | v1.1

ProcedureMetadata

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

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

**Description:** xray_equipment_manufacturer

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

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**Xray equipment model** IMPC_XRY_038_001 | v1.4

**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,

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**Settings time of exposure** IMPC_XRY_039_001 | v1.1

**Unit Measured:** s

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

procedureMetadata


Description: settings_level

Experimenter ID (scan) IMPC_XRY_041_001 | v1.1

procedureMetadata


Description: experimenter_scan_

Experimenter ID (analysis) IMPC_XRY_042_001 | v1.1

procedureMetadata


Description: experimenter_analysis_

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


XRay Images Whole Body Lateral Orientation  IMPC_XRY_048_001 | v1.2

seriesMediaParameter


Increments: Minimum 1

XRay Images Forepaw  IMPC_XRY_049_001 | v1.1

seriesMediaParameter


Increments: Minimum 1

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

Options: normal, abnormal, imageOnly, unobservable,

Scoliosis IMPC_XRY_056_001 | v1.2

simpleParameter

Options: yes, no, imageOnly, unobservable,
Kyphosis  IMPC_XRY_057_001  | v1.1

**Request Analysis:** false  **Request Upload:** false  **Is Annotated:** true

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

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Lordosis  IMPC_XRY_058_001  | v1.1

**Request Analysis:** false  **Request Upload:** false  **Is Annotated:** true

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

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Shape of ribcage  IMPC_XRY_059_001  | v1.1

**Request Analysis:** false  **Request Upload:** false  **Is Annotated:** true

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

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Transitional vertebrae  IMPC_XRY_060_001  | v1.1

**Request Analysis:** false  **Request Upload:** false  **Is Annotated:** true
Options: yes, no, imageOnly, unobservable,

Fusion of processes IMPC_XRY_061_001 | v1.1
simpleParameter


Options: yes, no, imageOnly, unobservable,

Polysyndactylism IMPC_XRY_062_001 | v1.1
simpleParameter


Options: yes, no, imageOnly, unobservable,

Cervical processes IMPC_XRY_063_001 | v1.1
simpleParameter


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*

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

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

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

*simpleParameter*

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

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

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

*simpleParameter*

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

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

simpleParameter


Options: abnormal, unobservable, normal, imageOnly,