

# X-ray TCPLA\_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 57

## 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 TCPLA\_XRY\_001\_001 | v1.0

simpleParameter

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

Description: skull\_shape

Options: normal, abnormal, imageOnly, unobservable,

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### Zygomatic bone TCPLA\_XRY\_002\_001 | v1.0

simpleParameter

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

Description: zygomatic\_bone

Options: normal, abnormal, imageOnly, unobservable,

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### Maxilla/Pre-maxilla TCPLA\_XRY\_003\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** maxilla

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

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## **Mandibles** TCPLA\_XRY\_004\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** mandibles

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

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## **Teeth** TCPLA\_XRY\_005\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** teeth

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

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## **Scapulae** TCPLA\_XRY\_006\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** scapulae

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

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## Clavicle TCPLA\_XRY\_007\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** clavicle

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

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## Number of ribs right TCPLA\_XRY\_008\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Description:** number\_of\_ribs\_right

---

## Number of ribs left TCPLA\_XRY\_009\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Description:** number\_of\_ribs\_left

---

## Shape of ribs TCPLA\_XRY\_010\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** shape\_of\_ribs

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

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## Fusion of ribs TCPLA\_XRY\_011\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** fusion\_of\_ribs

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

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## Pelvis TCPLA\_XRY\_012\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** pelvis

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

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## Number of cervical vertebrae TCPLA\_XRY\_013\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Description:** number\_of\_cervical\_vertebrae

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## Number of thoracic vertebrae TCPLA\_XRY\_014\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Description:** number\_of\_thoracic\_vertebrae

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## Number of lumbar vertebrae TCPLA\_XRY\_015\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Description:** number\_of\_lumbar\_vertebrae

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**Number of pelvic vertebrae** TCPLA\_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** TCPLA\_XRY\_017\_001 | v1.0

simpleParameter

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

**Description:** number\_of\_caudal\_vertebrae

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**Shape of vertebrae** TCPLA\_XRY\_018\_001 | v1.0

simpleParameter

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

**Description:** shape\_of\_vertebrae

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

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## Fusion of vertebrae TCPLA\_XRY\_019\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** fusion\_of\_vertebrae

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

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## Processes on vertebrae TCPLA\_XRY\_020\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** processes\_on\_vertebrae

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

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## Humerus TCPLA\_XRY\_021\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** humerus

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

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## Radius TCPLA\_XRY\_022\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** radius

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

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## Ulna TCPLA\_XRY\_023\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** ulna

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

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## Femur TCPLA\_XRY\_024\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** femur

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

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## **Tibia** TCPLA\_XRY\_025\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** tibia

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

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## **Fibula** TCPLA\_XRY\_026\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** fibula

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

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## **Joints** TCPLA\_XRY\_027\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** joints

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

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## Number of digits TCPLA\_XRY\_028\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Description:** number\_of\_digits

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## Syndactylism TCPLA\_XRY\_029\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** syndactylism

**Options:** no syndactylism, Syndactylism, imageOnly, unobservable,

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## Brachydactyly TCPLA\_XRY\_030\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** completeness\_of\_digits

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

---

## Digit integrity TCPLA\_XRY\_031\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** digit\_integrity

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

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## Comment on XRay image TCPLA\_XRY\_032\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Description:** comment\_on\_xray\_image

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## Tibia length TCPLA\_XRY\_033\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Unit Measured:** mm

**Description:** tibia\_length

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# XRay Images Whole Body Dorso Ventral TCPLA\_XRY\_034\_001 | v1.0

seriesMediaParameter

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

Description: xray\_images

Increments: Minimum 1

---

# Alive TCPLA\_XRY\_035\_001 | v1.0

simpleParameter

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

Description: alive

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# Xray equipment ID TCPLA\_XRY\_036\_001 | v1.0

procedureMetadata

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

Description: xray\_equipment\_name

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# Xray equipment manufacturer TCPLA\_XRY\_037\_001 | v1.0

procedureMetadata

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

Description: xray\_equipment\_manufacturer

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

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# Xray equipment model TCPLA\_XRY\_038\_001 | v1.0

procedureMetadata

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

Description: xray\_equipment\_model

Options: MX-20-DC12, MX-20-DC4, R\_mCT (Micro-CT), MX-20, MS-FX Pro, UltraFocus 100, UltraFocus DXA,

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# Settings time of exposure TCPLA\_XRY\_039\_001 | v1.0

procedureMetadata

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

Unit Measured: s

Description: settings\_time\_of\_exposure

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# Settings level TCPLA\_XRY\_040\_001 | v1.0

procedureMetadata

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

Description: settings\_level

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# Experimenter ID (scan) TCPLA\_XRY\_041\_001 | v1.0

procedureMetadata

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

Description: experimenter\_scan\_

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# Experimenter ID (analysis) TCPLA\_XRY\_042\_001 | v1.0

procedureMetadata

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

Description: experimenter\_analysis\_

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# Voltage settings TCPLA\_XRY\_043\_001 | v1.0

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Description:** voltage\_settings

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**Scanner equipment ID** TCPLA\_XRY\_044\_001 | v1.0

[procedureMetadata](#)

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Description:** scanner\_equipment\_name

---

**Scanner equipment manufacturer** TCPLA\_XRY\_045\_001 | v1.0

[procedureMetadata](#)

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Description:** scanner\_equipment\_manufacturer

---

**Scanner equipment model** TCPLA\_XRY\_046\_001 | v1.0

[procedureMetadata](#)

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Description:** scanner\_equipment\_model

---

## Date Xray equipment last calibrated TCPLA\_XRY\_047\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## XRay Images Whole Body Lateral Orientation TCPLA\_XRY\_048\_001 | v1.0

seriesMediaParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Increments: Minimum 1

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## XRay Images Forepaw TCPLA\_XRY\_049\_001 | v1.0

seriesMediaParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Increments: Minimum 1

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## XRay Images Skull Lateral Orientation TCPLA\_XRY\_050\_001 | v1.0

seriesMediaParameter

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

Increments: Minimum 1

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## XRay Images Skull Dorso Ventral Orientation TCPLA\_XRY\_051\_001 | v1.0

seriesMediaParameter

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

Increments: Minimum 1

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## XRay Images Hind Leg and Hip TCPLA\_XRY\_052\_001 | v1.0

seriesMediaParameter

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

Increments: Minimum 1

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## Date Scanner equipment last calibrated TCPLA\_XRY\_053\_001 | v1.0

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

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## Free Ontology TCPLA\_XRY\_054\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

---

## Shape of spine TCPLA\_XRY\_055\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

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

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## Scoliosis TCPLA\_XRY\_056\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

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

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## Kyphosis TCPLA\_XRY\_057\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: yes, no, imageOnly, unobservable,

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## Lordosis TCPLA\_XRY\_058\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: yes, no, imageOnly, unobservable,

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## Shape of ribcage TCPLA\_XRY\_059\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: normal, abnormal, imageOnly, unobservable,

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## Transitional vertebrae TCPLA\_XRY\_060\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

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

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**Fusion of processes** TCPLA\_XRY\_061\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

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

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**Polysyndactylism** TCPLA\_XRY\_062\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

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

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**Cervical processes** TCPLA\_XRY\_063\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

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

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## Thoracic processes TCPLA\_XRY\_064\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: normal, abnormal, imageOnly, unobservable,

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## Lumbar processes TCPLA\_XRY\_065\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: normal, abnormal, imageOnly, unobservable,

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## Sacral processes TCPLA\_XRY\_066\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: normal, abnormal, imageOnly, unobservable,

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## Caudal processes TCPLA\_XRY\_067\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

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

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## Missing cranial rib TCPLA\_XRY\_068\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Options:** Yes, No,

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## Rib morphology TCPLA\_XRY\_069\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

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

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## Cervical vertebrae morphology TCPLA\_XRY\_070\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

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

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## Thoracic vertebrae morphology TCPLA\_XRY\_071\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: normal, imageOnly, unobservable, abnormal,

---

## Lumbar vertebrae morphology TCPLA\_XRY\_072\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: abnormal, imageOnly, unobservable, normal,

---

## Pelvic vertebrae morphology TCPLA\_XRY\_073\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: unobservable, abnormal, imageOnly, normal,

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# Caudal vertebrae morphology TCPLA\_XRY\_074\_001 | v1.0

simpleParameter

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

Options: unobservable, imageOnly, abnormal, normal,

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