**MicroCT E18.5 IMPC_EMA_002**

**Purpose**

To assess morphological defects in E18.5 embryos from lethal or subviable strains with MicroCT.

**Experimental Design**

- Set up timed matings with heterozygous mice
- Day 0 is defined as the midpoint of the prior dark cycle following the identification of a copulation plug.
- Collect embryos at E18.5 with 3 minimum homozygous and 1 littermate control
- Ensure embryos are bleed as much as possible.
- Reconstruct the scans according to manufacturer's instructions.

**Procedure**

1. Set up timed mating with heterozygous animals. Dissect and collect >=3 homozygote embryos.
2. Process the embryos using the centre's staining and embedding protocol. Centre-specific methods are recorded within a document
3. Scan and generate reconstructions of embryos.

**Notes**

Embryos may be processed for Histopathology.

**Parameters and Metadata**

**Embryo reconstruction IMPC_EMA_001_001 | v1.1**

**seriesMediaParameter**

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

**Increments:** Minimum 1
Image Pixel Size  IMPC_EMA_007_001 | v1.0

Unit Measured: \( \mu m \)

E18.5 MicroCT Preparation protocol  IMPC_EMA_008_001 | v1.0

Date equipment last calibrated  IMPC_EMA_009_001 | v1.0

Date of Sacrifice  IMPC_EMA_010_001 | v1.0
procedureMetadata


Date Preparation Finished IMPC_EMA_011_001 | v1.0
procedureMetadata


Date of Scan IMPC_EMA_012_001 | v1.0
procedureMetadata


Source Voltage IMPC_EMA_013_001 | v1.0
procedureMetadata


Unit Measured: kV

Source Current IMPC_EMA_014_001 | v1.1
procedureMetadata

**Object to Source**  IMPC_EMA_015_001 | v1.0

procedureMetadata

**Camera to Source**  IMPC_EMA_016_001 | v1.1

procedureMetadata

**Screenshots**  IMPC_EMA_017_001 | v1.1
Increments: Minimum 1

**Limb digits** IMPC_EMA_018_001 | v1.0

*simpleParameter*


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Tail** IMPC_EMA_019_001 | v1.0

*simpleParameter*


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Limbs** IMPC_EMA_020_001 | v1.0

*simpleParameter*


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,
**Pinna** IMPC_EMA_021_001 | v1.0

*simpleParameter*

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

*Options:* present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Vibrissa** IMPC_EMA_022_001 | v1.0

*simpleParameter*

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

*Options:* present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Edema** IMPC_EMA_023_001 | v1.0

*simpleParameter*

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

*Options:* yes, no, unobservable,

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**Embryo size** IMPC_EMA_024_001 | v1.0

*simpleParameter*
Spinal Cord  IMPC_EMA_025_001  |  v1.0

Spine curvature  IMPC_EMA_026_001  |  v1.0

Craniofacial morphology  IMPC_EMA_027_001  |  v1.0
**Hindbrain subarachnoid space**  IMPC_EMA_028_001 | v1.0

**simpleParameter**


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

**Midbrain roof plate**  IMPC_EMA_029_001 | v1.0

**simpleParameter**


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

**Midbrain**  IMPC_EMA_030_001 | v1.0

**simpleParameter**


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,
**Cerebellum** IMPC_EMA_031_001 | v1.0

simpleParameter

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Cerebral cortex** IMPC_EMA_032_001 | v1.0

simpleParameter

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Thalamus** IMPC_EMA_033_001 | v1.0

simpleParameter

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Corpus striatum** IMPC_EMA_034_001 | v1.0

simpleParameter

Req. Analysis: false  
Req. Upload: false  
Is Annotated: true
Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,
**Pons** IMPC_EMA_038_001 | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Medulla oblongata** IMPC_EMA_039_001 | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Lateral ventricles** IMPC_EMA_040_001 | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Lateral ventricle choroid plexus** IMPC_EMA_041_001 | v1.0

simpleParameter
4th ventricle choroid plexus \textbf{IMPC\textunderscore EMA\textunderscore 042\textunderscore 001} | v1.0

\textbf{simpleParameter}

4th Ventricle \textbf{IMPC\textunderscore EMA\textunderscore 043\textunderscore 001} | v1.0

\textbf{simpleParameter}

Cerebral aqueduct \textbf{IMPC\textunderscore EMA\textunderscore 044\textunderscore 001} | v1.0

\textbf{simpleParameter}
**Median sulcus** IMPC_EMA_045_001 | v1.0

simpleParameter

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

**3rd ventricle** IMPC_EMA_046_001 | v1.0

simpleParameter

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

**Olfactory lobe** IMPC_EMA_047_001 | v1.0

simpleParameter

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,
**Trigeminal ganglion** IMPC_EMA_048_001 | v1.0

**simpleParameter**

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

**Options:** present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Pituitary gland** IMPC_EMA_049_001 | v1.0

**simpleParameter**

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

**Options:** present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Spinal cord cervical region** IMPC_EMA_050_001 | v1.0

**simpleParameter**

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

**Options:** present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Dorsal root ganglion** IMPC_EMA_051_001 | v1.0

**simpleParameter**

**Req. Analysis:** false  **Req. Upload:** true  **Is Annotated:** true
Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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Cochlea IMPC_EMA_052_001 | v1.0
simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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Nasal septum IMPC_EMA_053_001 | v1.0
simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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Nasal cavity IMPC_EMA_054_001 | v1.0
simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,
Nasopharynx IMPC_EMA_055_001 | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

Vomeronasal organ IMPC_EMA_056_001 | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

Oropharynx IMPC_EMA_057_001 | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

Oral cavity IMPC_EMA_058_001 | v1.0

simpleParameter
Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Optic nerve** IMPC_EMA_059_001 | v1.0

simpleParameter

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Intraretinal space** IMPC_EMA_060_001 | v1.0

simpleParameter

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Hyaloid cavity** IMPC_EMA_061_001 | v1.0

simpleParameter

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,
Cornea  IMPC_EMA_062_001  | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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Lens  IMPC_EMA_063_001  | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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Eyelids  IMPC_EMA_064_001  | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,
**Temporal bone** IMPC_EMA_065_001 | v1.0

*simpleParameter*

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Pharyngo-tympanic tube** IMPC_EMA_066_001 | v1.0

*simpleParameter*

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Palate** IMPC_EMA_067_001 | v1.0

*simpleParameter*

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Epiglottis** IMPC_EMA_068_001 | v1.0

*simpleParameter*

Req. Analysis: false  
Req. Upload: true  
Is Annotated: true
**Tongue**  IMPC_EMA_069_001 | v1.0

*simpleParameter*

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Mandible**  IMPC_EMA_070_001 | v1.0

*simpleParameter*

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Lower jaw molar**  IMPC_EMA_071_001 | v1.0

*simpleParameter*

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,
**Upper jaw molar** IMPC_EMA_072_001 | v1.0

*simpleParameter*

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly

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**Sphenoid bone** IMPC_EMA_073_001 | v1.0

*simpleParameter*

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly

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**Thyroid gland** IMPC_EMA_074_001 | v1.0

*simpleParameter*

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly

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**Submandibular gland** IMPC_EMA_075_001 | v1.0

*simpleParameter*
Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

**Brown fat** IMPC_EMA_076_001 | v1.0

simpleParameter

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

**Vertebrae** IMPC_EMA_077_001 | v1.0

simpleParameter

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

**Esophagus** IMPC_EMA_078_001 | v1.0

simpleParameter

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,
**Clavicle** IMPC_EMA_079_001 | v1.0

Simple parameter

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

*Options:* present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Scapula** IMPC_EMA_080_001 | v1.0

Simple parameter

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

*Options:* present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Ulna** IMPC_EMA_081_001 | v1.0

Simple parameter

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

*Options:* present, absent, abnormal, unobservable, ambiguous, imageOnly,
**Humerus**  IMPC_EMA_082_001 | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Arytenoid cartilage**  IMPC_EMA_083_001 | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Cricoid cartilage**  IMPC_EMA_084_001 | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Trachea**  IMPC_EMA_085_001 | v1.0

simpleParameter

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

Carotid artery IMPC_EMA_086_001 | v1.0
simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

Thymus IMPC_EMA_087_001 | v1.0
simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

Sternum IMPC_EMA_088_001 | v1.0
simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,
**Rib** IMPC_EMA_089_001 | v1.0

*simpleParameter*

**Options:** present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**T1 rib** IMPC_EMA_090_001 | v1.0

*simpleParameter*

**Options:** present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Vena cava** IMPC_EMA_091_001 | v1.0

*simpleParameter*

**Options:** present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Inferior vena cava** IMPC_EMA_092_001 | v1.0

*simpleParameter*
**Superior vena cava**  IMPC_EMA_093_001 | v1.0

*simpleParameter*

**Jugular vein**  IMPC_EMA_094_001 | v1.0

*simpleParameter*

**Ductus arteriosus**  IMPC_EMA_095_001 | v1.0

*simpleParameter*
**Pulmonary valve** IMPC_EMA_096_001 | v1.0

*simpleParameter*

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

**Options:** present, absent, abnormal, unobservable, ambiguous, imageOnly,

**Pulmonary trunk** IMPC_EMA_097_001 | v1.0

*simpleParameter*

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

**Options:** present, absent, abnormal, unobservable, ambiguous, imageOnly,

**Dorsal aorta** IMPC_EMA_098_001 | v1.0

*simpleParameter*

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

**Options:** present, absent, abnormal, unobservable, ambiguous, imageOnly,
**Ductus venosus** IMPC_EMA_099_001 | v1.0

*simpleParameter*

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Aorta** IMPC_EMA_100_001 | v1.0

*simpleParameter*

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Aortic valve** IMPC_EMA_101_001 | v1.0

*simpleParameter*

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Heart atrium** IMPC_EMA_102_001 | v1.0

*simpleParameter*

Req. Analysis: false  
Req. Upload: true  
Is Annotated: true
Heart ventricle  IMPC_EMA_103_001  | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

Tricuspid valve  IMPC_EMA_104_001  | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

Mitral valve  IMPC_EMA_105_001  | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,
**Interventricular septum** IMPC_EMA_106_001 | v1.0

simpleParameter

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Pericardial cavity** IMPC_EMA_107_001 | v1.0

simpleParameter

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Pericardium** IMPC_EMA_108_001 | v1.0

simpleParameter

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Main bronchus** IMPC_EMA_109_001 | v1.0

simpleParameter
**Bronchus** IMPC_EMA_110_001 | v1.0

*simpleParameter*

**Right lung cranial lobe** IMPC_EMA_111_001 | v1.0

*simpleParameter*

**Right lung middle lobe** IMPC_EMA_112_001 | v1.0

*simpleParameter*
Right lung caudal lobe  IMPC_EMA_113_001  | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

Right lung accessory lobe  IMPC_EMA_114_001  | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

Left lung  IMPC_EMA_115_001  | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,
**Diaphragm**  IMPC_EMA_116_001 | v1.0

*simpleParameter*

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

**Options:** present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Peritoneal cavity**  IMPC_EMA_117_001 | v1.0

*simpleParameter*

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

**Options:** present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Liver**  IMPC_EMA_118_001 | v1.0

*simpleParameter*

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

**Options:** present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Liver left lobe**  IMPC_EMA_119_001 | v1.0

*simpleParameter*

**Req. Analysis:** false  
**Req. Upload:** true  
**Is Annotated:** true
Liver right lobe IMPC_EMA_120_001 | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,
Liver lobar interzone IMPC_EMA_123_001 | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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Pancreas IMPC_EMA_124_001 | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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Stomach IMPC_EMA_125_001 | v1.0

simpleParameter


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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Pyloric antrum IMPC_EMA_126_001 | v1.0

simpleParameter
Stomach fundus  IMPC_EMA_127_001 | v1.0

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

Stomach lumen  IMPC_EMA_128_001 | v1.0

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

Small intestine  IMPC_EMA_129_001 | v1.0

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,
**Hindgut**  IMPC_EMA_130_001 | v1.0

*simpleParameter*

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

**Options:** present, absent, abnormal, unobservable, ambiguous, imageOnly,

**Midgut**  IMPC_EMA_131_001 | v1.0

*simpleParameter*

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

**Options:** present, absent, abnormal, unobservable, ambiguous, imageOnly,

**Hip joint**  IMPC_EMA_132_001 | v1.0

*simpleParameter*

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

**Options:** present, absent, abnormal, unobservable, ambiguous, imageOnly,
Femur  IMPC_EMA_133_001 | v1.0


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

Fibula  IMPC_EMA_134_001 | v1.0


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

Tibia  IMPC_EMA_135_001 | v1.0


Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

Adrenal gland  IMPC_EMA_136_001 | v1.0

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Kidney** IMPC_EMA_137_001 | v1.0

*simpleParameter*

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Renal calyx** IMPC_EMA_138_001 | v1.0

*simpleParameter*

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

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**Bladder** IMPC_EMA_139_001 | v1.0

*simpleParameter*

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,
**Rectum** IMPC_EMA_140_001 | v1.0

simpleParameter

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

**Spleen** IMPC_EMA_141_001 | v1.0

simpleParameter

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

**Ovary** IMPC_EMA_142_001 | v1.0

simpleParameter

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

Options: present, absent, abnormal, unobservable, ambiguous, imageOnly,

**Testes** IMPC_EMA_143_001 | v1.0

simpleParameter
**Penis**  
**IMPC_EMA_144_001 | v1.0**  
simpleParameter

**Circumventricular organ**  
**IMPC_EMA_145_001 | v1.0**  
simpleParameter

**Hyoid**  
**IMPC_EMA_146_001 | v1.0**  
simpleParameter
Severely dysmorphic IMPC_EMA_147_001 | v1.0

simpleParameter


Options: yes, no, unobservable,

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Delayed embryonic development IMPC_EMA_148_001 | v1.0

simpleParameter


Options: yes, no, unobservable,

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Annotator ID IMPC_EMA_149_001 | v1.0

procedureMetadata


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Date of Annotation IMPC_EMA_150_001 | v1.0

procedureMetadata