

# Embryo LacZ IMPC\_ELZ\_001

## Purpose

To stain mutant and control embryos for bacterial beta-galactosidase (LacZ) activity in order to assess the embryonic gene expression of IKMC alleles at embryonic day 12.5 (E12.5).

**Description:** Whole-mount or sections of stained E12.5 embryos are scored for presence of LacZ staining. Intensity of staining is not required but can be reported. Anatomical terms to localize staining to the structure or substructure will use standard EMAP ontology terms.

## Experimental Design

Outcrosses (Het x WT) or intercrosses (Het x Het) may be used for the protocol.

For outcrosses, genotype confirmation should be performed if no embryos display positive staining.

For intercrosses, genotype confirmation must be performed on ALL samples to distinguish heterozygous and homozygous stained embryos.

Mutants:

- Embryos are harvested, fixed, processed, and stained according to centre-specific protocols
- Embryos with staining are scored and imaged, concurrent with genotyping to determine zygosity and to identify controls
- **Minimum number of animals** : 1 mutant of any sex
- **Age at test:** E12.5

Controls:

- Wild type littermate E12.5 embryos that do not exhibit any endogenous mammalian b-galactosidase activity are used as controls. C57BL/6N litters can be stained at each centre's discretion.

## Procedure

1. Embryos are stained in whole-mount according to centre-specific protocols. Centre-specific methods will be provided and be on file and linked to the data for each mutant line
2. If there is no staining, all embryos are genotype confirmed.

3. When positive staining is found, a representative image will be taken and uploaded for each mutant line. If heterozygous and homozygous embryos are stained, a representative image of each can be uploaded. The image will have a sizing reference bar.
4. The metadata collected for embryonic litter will be associated with the image
5. Annotations will derive from the heterozygous embryo only.
6. For each embryo the scoring system will be: "Expression" (specific staining), "No Expression" (no staining), " Ambiguous" (non-specific, not clear), "imageOnly". or "tissue not available"

If capturing images please attempt to capture left, right, front, and back views of the embryo.

## Notes

### Data QC

Quality control for each centre's processes and annotation will be established by that centre's staff and published as part of their detailed protocol

## Parameters and Metadata

### Embryo IMPC\_ELZ\_001\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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### Head IMPC\_ELZ\_002\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## Forelimb IMPC\_ELZ\_003\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Forearm IMPC\_ELZ\_004\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Radius-ulna pre cartilage condensation IMPC\_ELZ\_005\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Upper arm IMPC\_ELZ\_006\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Humerus pre-cartilage condensation** IMPC\_ELZ\_007\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Handplate** IMPC\_ELZ\_008\_001 | v1.1

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Hindlimb** IMPC\_ELZ\_009\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## Footplate IMPC\_ELZ\_010\_001 | v1.1

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## Lower leg IMPC\_ELZ\_011\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## Upper leg IMPC\_ELZ\_012\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## Femur pre-cartilage condensation IMPC\_ELZ\_013\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Head mesenchyme IMPC\_ELZ\_014\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Trunk mesenchyme IMPC\_ELZ\_015\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Notochord IMPC\_ELZ\_016\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Skin** IMPC\_ELZ\_017\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Vibrissa** IMPC\_ELZ\_018\_001 | v1.1

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Oral cavity** IMPC\_ELZ\_019\_001 | v1.1

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## Mandibular process IMPC\_ELZ\_020\_001 | v1.1

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Meckel's cartilage IMPC\_ELZ\_021\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Maxillary process IMPC\_ELZ\_022\_001 | v1.1

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Gut IMPC\_ELZ\_023\_001 | v1.1

simpleParameter



**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Pharynx** IMPC\_ELZ\_024\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Tongue** IMPC\_ELZ\_025\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Stomach** IMPC\_ELZ\_026\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Pancreas** IMPC\_ELZ\_027\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Liver** IMPC\_ELZ\_028\_001 | v1.1

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Urinary system** IMPC\_ELZ\_029\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## Metanephros IMPC\_ELZ\_030\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Mesonephros of male IMPC\_ELZ\_031\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Mesonephros of female IMPC\_ELZ\_032\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Lung IMPC\_ELZ\_033\_001 | v1.1

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Trachea** IMPC\_ELZ\_034\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Umbilical artery embryonic part** IMPC\_ELZ\_035\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Heart** IMPC\_ELZ\_036\_001 | v1.1

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## Atrium IMPC\_ELZ\_037\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Outflow tract IMPC\_ELZ\_038\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Pericardium IMPC\_ELZ\_039\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Heart ventricle IMPC\_ELZ\_040\_001 | v1.1

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Umbilical vein embryonic part** IMPC\_ELZ\_041\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Brain** IMPC\_ELZ\_042\_001 | v1.1

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Forebrain** IMPC\_ELZ\_043\_001 | v1.1

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## Midbrain IMPC\_ELZ\_044\_001 | v1.1

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## Central nervous system ganglion IMPC\_ELZ\_045\_001 | v1.1

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## Spinal cord IMPC\_ELZ\_046\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## Dorsal root ganglion IMPC\_ELZ\_047\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Ear IMPC\_ELZ\_048\_001 | v1.1

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## External ear IMPC\_ELZ\_049\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Inner Ear IMPC\_ELZ\_050\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true



**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Eye** IMPC\_ELZ\_051\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Nose** IMPC\_ELZ\_052\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## **Nasal septum** IMPC\_ELZ\_053\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## Fronto-nasal process IMPC\_ELZ\_054\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Skeleton IMPC\_ELZ\_055\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Axial skeleton IMPC\_ELZ\_056\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Rib pre-cartilage condensation IMPC\_ELZ\_057\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Thoracic vertebral cartilage condensation IMPC\_ELZ\_058\_001 | v1

.1

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Cranium IMPC\_ELZ\_059\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Tail IMPC\_ELZ\_060\_001 | v1.1

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## Tail somite group IMPC\_ELZ\_061\_001 | v1.2

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## Intestine IMPC\_ELZ\_062\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,

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## LacZ images section IMPC\_ELZ\_063\_001 | v1.2

seriesMediaParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Increments:** Minimum 1

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## LacZ images wholemount IMPC\_ELZ\_064\_001 | v1.3

seriesMediaParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Increments: Minimum 1

---

## Free ontology IMPC\_ELZ\_065\_001 | v1.1

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Free ontology annotation reason IMPC\_ELZ\_066\_001 | v1.1

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Free text comment IMPC\_ELZ\_067\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Microscope equipment id IMPC\_ELZ\_068\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

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## Microscope equipment manufacturer IMPC\_ELZ\_069\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

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## Microscope equipment model IMPC\_ELZ\_070\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

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## Date Microscope last calibrated IMPC\_ELZ\_071\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Detector equipment manufacturer IMPC\_ELZ\_072\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Detector equipment model IMPC\_ELZ\_073\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Objective equipment company IMPC\_ELZ\_074\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Objective equipment model IMPC\_ELZ\_075\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Objective magnification IMPC\_ELZ\_076\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## **Illumination source manufacturer** IMPC\_ELZ\_077\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## **Sample preparation stain name** IMPC\_ELZ\_079\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

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## **Sample preparation reference impc** IMPC\_ELZ\_080\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

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## **Bit depth** IMPC\_ELZ\_081\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Colorspace IMPC\_ELZ\_082\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Experimental category IMPC\_ELZ\_083\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Orientation IMPC\_ELZ\_084\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Pixels per millimeter before processing IMPC\_ELZ\_085\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## **Pixels per millimeter after processing** IMPC\_ELZ\_086\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

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## **Showcase image** IMPC\_ELZ\_087\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## **Date of sacrifice** IMPC\_ELZ\_088\_001 | v1.2

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

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## **Date of staining** IMPC\_ELZ\_089\_001 | v1.3

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## **Date of annotation** IMPC\_ELZ\_090\_001 | v1.2

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Date of image capture IMPC\_ELZ\_091\_001 | v1.2

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Hindbrain IMPC\_ELZ\_092\_001 | v1.1

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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## Placenta IMPC\_ELZ\_093\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,

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