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 beta-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


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

**Head** IMPC_ELZ_002_001 | v1.0

simpleParameter


Options: expression, no expression, ambiguous, imageOnly, tissue not available,
Forelimb IMPC_ELZ_003_001 | v1.0

simpleParameter


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

Forearm IMPC_ELZ_004_001 | v1.0

simpleParameter


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

Radius-ulna pre cartilage condensation IMPC_ELZ_005_001 | v1.0

simpleParameter


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

Upper arm IMPC_ELZ_006_001 | v1.0

simpleParameter
Humerus pre-cartilage condensation  IMPC_ELZ_007_001 | v1.0

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

Handplate  IMPC_ELZ_008_001 | v1.1

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

Hindlimb  IMPC_ELZ_009_001 | v1.0

Options: expression, no expression, ambiguous, imageOnly, tissue not available,
Footplate IMPC_ELZ_010_001 | v1.1


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

Lower leg IMPC_ELZ_011_001 | v1.0


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

Upper leg IMPC_ELZ_012_001 | v1.0


Options: expression, no expression, ambiguous, imageOnly, tissue not available,
**Femur pre-cartilage condensation** IMPC_ELZ_013_001 | v1.0


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

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**Head mesenchyme** IMPC_ELZ_014_001 | v1.0


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

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**Trunk mesenchyme** IMPC_ELZ_015_001 | v1.0


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

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**Notochord** IMPC_ELZ_016_001 | v1.0

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

Skin IMPC_ELZ_017_001 | v1.0


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

Vibrissa IMPC_ELZ_018_001 | v1.1


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

Oral cavity IMPC_ELZ_019_001 | v1.1


Options: expression, no expression, ambiguous, imageOnly, tissue not available,
**Mandibular process** IMPC_ELZ_020_001 | v1.1
simpleParameter


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

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**Meckel's cartilage** IMPC_ELZ_021_001 | v1.0
simpleParameter


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

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**Maxillary process** IMPC_ELZ_022_001 | v1.1
simpleParameter


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

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**Gut** IMPC_ELZ_023_001 | v1.1
simpleParameter
**Pharynx**  IMPC_ELZ_024_001 | v1.0

simpleParameter

**Tongue**  IMPC_ELZ_025_001 | v1.0

simpleParameter

**Stomach**  IMPC_ELZ_026_001 | v1.0

simpleParameter
**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,
**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
**Trachea** IMPC_ELZ_034_001 | v1.0

*simpleParameter*

**Umbilical artery embryonic part** IMPC_ELZ_035_001 | v1.0

*simpleParameter*

**Heart** IMPC_ELZ_036_001 | v1.1

*simpleParameter*
**Atrium** IMPC_ELZ_037_001 | v1.0

`simpleParameter`

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

**Outflow tract** IMPC_ELZ_038_001 | v1.0

`simpleParameter`

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

**Pericardium** IMPC_ELZ_039_001 | v1.0

`simpleParameter`

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

**Heart ventricle** IMPC_ELZ_040_001 | v1.1

`simpleParameter`
**Umbilical vein embryonic part** IMPC_ELZ_041_001 | v1.0

simpleParameter

**Brain** IMPC_ELZ_042_001 | v1.1

simpleParameter

**Forebrain** IMPC_ELZ_043_001 | v1.1

simpleParameter
**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,
Dorsal root ganglion  IMPC_ELZ_047_001 | v1.0

simpleParameter


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

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Ear  IMPC_ELZ_048_001 | v1.1

simpleParameter


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

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External ear  IMPC_ELZ_049_001 | v1.0

simpleParameter


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

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Inner Ear  IMPC_ELZ_050_001 | v1.0

simpleParameter

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

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**Eye** IMPC_ELZ_051_001 | v1.0

*simpleParameter*


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

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**Nose** IMPC_ELZ_052_001 | v1.0

*simpleParameter*


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

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**Nasal septum** IMPC_ELZ_053_001 | v1.0

*simpleParameter*


Options: expression, no expression, ambiguous, imageOnly, tissue not available,
**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*
Thoracic vertebral cartilage condensation IMPC_ELZ_058_001 | v1.1

Cranium IMPC_ELZ_059_001 | v1.0

Tail IMPC_ELZ_060_001 | v1.1
Tail somite group  IMPC_ELZ_061_001  | v1.2
simpleParameter


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

Intestine  IMPC_ELZ_062_001  | v1.0
simpleParameter


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

LacZ images section  IMPC_ELZ_063_001  | v1.2
seriesMediaParameter


Increments: Minimum 1
LacZ images wholemount  IMPC_ELZ_064_001 | v1.3
seriesMediaParameter
Increments: Minimum 1

Free ontology  IMPC_ELZ_065_001 | v1.1
simpleParameter

Free ontology annotation reason  IMPC_ELZ_066_001 | v1.1
simpleParameter

Free text comment  IMPC_ELZ_067_001 | v1.0
simpleParameter
**Microscope equipment id** IMPC_ELZ_068_001 | v1.0

**Microscope equipment manufacturer** IMPC_ELZ_069_001 | v1.0

**Microscope equipment model** IMPC_ELZ_070_001 | v1.0

**Date Microscope last calibrated** IMPC_ELZ_071_001 | v1.0

**Detector equipment manufacturer** IMPC_ELZ_072_001 | v1.0
Detector equipment model  IMPC_ELZ_073_001 | v1.1

Objective equipment company  IMPC_ELZ_074_001 | v1.0

Objective equipment model  IMPC_ELZ_075_001 | v1.0

Objective magnification  IMPC_ELZ_076_001 | v1.0
**Illumination source manufacturer**  IMPC_ELZ_077_001 | v1.0

**Sample preparation stain name**  IMPC_ELZ_079_001 | v1.0

**Sample preparation reference impc**  IMPC_ELZ_080_001 | v1.1

**Bit depth**  IMPC_ELZ_081_001 | v1.1
Colors\textspace\textbf{space} \textbf{IMPC\_ELZ\_082\_001 | v1.0}

\textbf{Experimental category} \textbf{IMPC\_ELZ\_083\_001 | v1.0}

\textbf{Orientation} \textbf{IMPC\_ELZ\_084\_001 | v1.0}

\textbf{Pixels per millimeter before processing} \textbf{IMPC\_ELZ\_085\_001 | v1.0}
**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*
**Date of image capture** IMPC_ELZ_091_001 | v1.2

**Hindbrain** IMPC_ELZ_092_001 | v1.1

**Placenta** IMPC_ELZ_093_001 | v1.0