**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

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**Options:** expression, no expression, ambiguous, imageOnly, tissue not available,
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**Head** IMPC_ELZ_002_001 | v1.0

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

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

**Forearm**  IMPC_ELZ_004_001 | v1.0

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

**Radius-ulna pre cartilage condensation**  IMPC_ELZ_005_001 | v1.0

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

**Upper arm**  IMPC_ELZ_006_001 | v1.0

Options: expression, no expression, ambiguous, imageOnly, tissue not available,
Humerus pre-cartilage condensation IMPC_ELZ_007_001 | v1.0

simpleParameter


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

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Handplate IMPC_ELZ_008_001 | v1.1

simpleParameter


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

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Hindlimb IMPC_ELZ_009_001 | v1.0

simpleParameter


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

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Footplate IMPC_ELZ_010_001 | v1.1

simpleParameter

**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,
**Head mesenchyme** IMPC_ELZ_014_001 | v1.0

simpleParameter


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

**Trunk mesenchyme** IMPC_ELZ_015_001 | v1.0

simpleParameter


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

**Notochord** IMPC_ELZ_016_001 | v1.0

simpleParameter


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

**Skin** IMPC_ELZ_017_001 | v1.0

simpleParameter


Options: expression, no expression, ambiguous, imageOnly, tissue not available,
**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*
Maxillary process IMPC_ELZ_022_001 | v1.1
simpleParameter

Is Annotated: true

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

Gut IMPC_ELZ_023_001 | v1.1
simpleParameter

Is Annotated: true

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

Pharynx IMPC_ELZ_024_001 | v1.0
simpleParameter

Is Annotated: true

Options: expression, no expression, ambiguous, imageOnly, tissue not available,
**Tongue**  IMPC_ELZ_025_001 | v1.0
simpleParameter


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

**Stomach**  IMPC_ELZ_026_001 | v1.0
simpleParameter


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

**Pancreas**  IMPC_ELZ_027_001 | v1.0
simpleParameter


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

**Liver**  IMPC_ELZ_028_001 | v1.1
simpleParameter

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

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**Urinary system**  IMPC_ELZ_029_001 | v1.0

*simpleParameter*


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

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**Metanephros**  IMPC_ELZ_030_001 | v1.0

*simpleParameter*


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

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**Mesonephros of male**  IMPC_ELZ_031_001 | v1.0

*simpleParameter*


Options: expression, no expression, ambiguous, imageOnly, tissue not available,
Mesonephros of female IMPC_ELZ_032_001 | v1.0

simpleParameter


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

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Lung IMPC_ELZ_033_001 | v1.1

simpleParameter


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

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Trachea IMPC_ELZ_034_001 | v1.0

simpleParameter


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

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Umbilical artery embryonic part IMPC_ELZ_035_001 | v1.0

simpleParameter


Options: expression, no expression, ambiguous, imageOnly, tissue not available,
**Heart**  IMPC_ELZ_036_001 | v1.1

simpleParameter


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

**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
Heart ventricle  IMPC_ELZ_040_001 | v1.1
d| | simpleParameter
| Options: expression, no expression, ambiguous, imageOnly, tissue not available,

Umbilical vein embryonic part  IMPC_ELZ_041_001 | v1.0
d| | simpleParameter
| Options: expression, no expression, ambiguous, imageOnly, tissue not available,

Brain  IMPC_ELZ_042_001 | v1.1
| simpleParameter
| Options: expression, no expression, ambiguous, imageOnly, tissue not available,
Forebrain IMPC_ELZ_043_001 | v1.1

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

Midbrain IMPC_ELZ_044_001 | v1.1

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

Central nervous system ganglion IMPC_ELZ_045_001 | v1.1

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

Spinal cord IMPC_ELZ_046_001 | v1.0
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,

Ear IMPC_ELZ_048_001 | v1.1
simpleParameter


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

External ear IMPC_ELZ_049_001 | v1.0
simpleParameter


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


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

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**Skeleton** IMPC_ELZ_055_001 | v1.0

simpleParameter


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

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**Axial skeleton** IMPC_ELZ_056_001 | v1.0

simpleParameter


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

simpleParameter

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Craniun IMPC_ELZ_059_001  | v1.0

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Tail IMPC_ELZ_060_001  | v1.1

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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

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**Free ontology** IMPC_ELZ_065_001 | v1.1

simpleParameter


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**Free ontology annotation reason** IMPC_ELZ_066_001 | v1.1

simpleParameter


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**Free text comment** IMPC_ELZ_067_001 | v1.0

simpleParameter


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**Microscope equipment id** IMPC_ELZ_068_001 | v1.0

procedureMetadata


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**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

Colorspace  IMPC_ELZ_082_001 | v1.0

Experimental category  IMPC_ELZ_083_001 | v1.0
**Orientation**  
IMPC_ELZ_084_001 | v1.0

**Pixels per millimeter before processing**  
IMPC_ELZ_085_001 | v1.0

**Pixels per millimeter after processing**  
IMPC_ELZ_086_001 | v1.1

**Showcase image**  
IMPC_ELZ_087_001 | v1.0

**Date of sacrifice**  
IMPC_ELZ_088_001 | v1.2
Date of staining: IMPC_ELZ_089_001 | v1.3

Date of annotation: IMPC_ELZ_090_001 | v1.2

Date of image capture: IMPC_ELZ_091_001 | v1.2

Hindbrain: IMPC_ELZ_092_001 | v1.1

Options: expression, no expression, ambiguous, imageOnly, tissue not available,
Placenta IMPC_ELZ_093_001 | v1.0

simpleParameter


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