**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

**Embry**o IMPC_ELZ_001_001 | v1.0

 simplesParameter


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

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**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**

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

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

**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,

**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,

**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,

**Head mesenchyme** IMPC_ELZ_014_001 | v1.0

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

**Trunk mesenchyme** IMPC_ELZ_015_001 | v1.0

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

**Notochord** IMPC_ELZ_016_001 | v1.0

**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


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

Oral cavity IMPC_ELZ_019_001 | v1.1

simpleParameter


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,

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

simpleParameter


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

**Maxillary process** IMPC_ELZ_022_001 | v1.1

simpleParameter


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

**Gut** IMPC_ELZ_023_001 | v1.1

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

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**Pharynx**  IMPC_ELZ_024_001 | v1.0

simpleParameter

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

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**Tongue**  IMPC_ELZ_025_001 | v1.0

simpleParameter

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

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**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,

Urinary system  IMPC_ELZ_029_001  | v1.0
simpleParameter


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
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,

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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


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

**Brain** IMPC_ELZ_042_001 | v1.1

**Forebrain** IMPC_ELZ_043_001 | v1.1
Midbrain  IMPC_ELZ_044_001  | v1.1

simpleParameter


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

Central nervous system ganglion  IMPC_ELZ_045_001  | v1.1

simpleParameter


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

Spinal cord  IMPC_ELZ_046_001  | v1.0

simpleParameter


Options: expression, no expression, ambiguous, imageOnly, tissue not available,
**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,
**Fronto-nasal process** IMPC_ELZ_054_001 | v1.0

simpleParameter


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

**Skeleton** IMPC_ELZ_055_001 | v1.0

simpleParameter


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

**Axial skeleton** IMPC_ELZ_056_001 | v1.0

simpleParameter


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

**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
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


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
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<th>Is Annotated</th>
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Pixels per millimeter after processing

Showcase image

Date of sacrifice

Date of staining

Date of annotation
**Date of image capture** IMPC_ELZ_091_001 | v1.2

**Hindbrain** IMPC_ELZ_092_001 | v1.1

**Placenta** IMPC_ELZ_093_001 | v1.0

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