# Gross Morphology Embryo E14.5-E15.5 IMPC_GEO_002

## Purpose

To assess visible morphological defects in E14.5-E15.5 embryos from lethal strains

## 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.
- **Minimum number of animals :** 1 mutant of any sex
- **Age at test:** E14.5-E15.5
- Capture gross images (**optional**)
- Collect tissue and genotype embryos.

## Procedure

1. **Set up timed mating with heterozygous animals. Dissect at a consistent time and collect >=2 homozygote embryos. Coordination with viability screen is at the centres discretion.**
2. **Score embryos as live or dead if possible.**
3. **Assess embryos according to Gross Morphology parameters.**
4. **Generate gross images of embryos (optional) with scored defects and control embryos.**
5. **Collect tissue for genotyping**
6. **Process embryos for Histopathology, or other imaging (OPTIONAL - depending on center pipeline)**
7. **Scores will be shown per embryo and split by zygosity.**

If capturing images please attempt to capture left, right, front, and back views of the embryo but if this is not possible left, right is sufficient. Feel free to take higher magnification views to show morphologies of interest.

## Notes

All genotypes should be collected using validated assays.

Y chromosome assay required for X-linked lethal strains.

Embryos may be processed for Histopathology or 3D Imaging

## Parameters and Metadata

### Alive IMPC_GEO_001_001 | v1.0

simpleParameter

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

**Description:** alive

**Options:** yes, no,

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### Scored IMPC_GEO_002_001 | v1.0

simpleParameter

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

**Description:** scored

**Options:** yes, no,

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### Cardiovascular System IMPC_GEO_003_001 | v1.0

simpleParameter

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

**Description:** cardiovascular_system

**Options:** normal, abnormal, unobservable,

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## Cardiovascular Development IMPC_GEO_004_001 | v1.0

simpleParameter

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

**Description:** cardiovascular_development

**Options:** normal, abnormal, unobservable,

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## Heart Development IMPC_GEO_005_001 | v1.0

simpleParameter

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

**Description:** heart_development

**Options:** normal, abnormal, unobservable,

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## Outflow tract development IMPC_GEO_006_001 | v1.0

simpleParameter

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

**Description:** outflow_tract_development

**Options:** normal, abnormal, unobservable,

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## Heart Morphology IMPC_GEO_008_001 | v1.0

simpleParameter

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

**Description:** heart_morphology

**Options:** normal, abnormal, unobservable,

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## Blood Vessel Morphology IMPC_GEO_011_001 | v1.0

simpleParameter

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

**Description:** blood_vessel_morphology

**Options:** normal, abnormal, unobservable,

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## Developmental Vascular Remodelling IMPC_GEO_012_001 | v1.0

simpleParameter

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

**Description:** developmental_vascular_remodelling

**Options:** normal, abnormal, unobservable,

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## Craniofacial IMPC_GEO_013_001 | v1.0

simpleParameter

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

**Description:** craniofacial

**Options:** normal, abnormal, unobservable,

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## Craniofacial Development IMPC_GEO_014_001 | v1.0

simpleParameter

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

**Description:** craniofacial_development

**Options:** normal, abnormal, unobservable,

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## Head shape IMPC_GEO_015_001 | v1.0

simpleParameter

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

**Description:** head_shape

**Options:** normal, abnormal, unobservable,

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## Head size IMPC_GEO_016_001 | v1.0

simpleParameter

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

**Description:** head_size

**Options:** normal, abnormal, unobservable,

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## Embryo Size IMPC_GEO_019_001 | v1.0

simpleParameter

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

**Description:** embryo_size

**Options:** normal, abnormal, unobservable,

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## Body wall morphology IMPC_GEO_020_001 | v1.0

simpleParameter

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

**Description:** body_wall_morphology

**Options:** normal, abnormal, unobservable,

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## Hearing/Vestibular/Ear IMPC_GEO_021_001 | v1.0

simpleParameter

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

**Description:** hearing_vestibular_ear

**Options:** normal, abnormal, unobservable,

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## Ear Morphology IMPC_GEO_022_001 | v1.1

simpleParameter

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

**Description:** abnormal_ear_morphology

**Options:** normal, abnormal, unobservable,

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## Ear Development IMPC_GEO_023_001 | v1.0

simpleParameter

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

**Description:** ear_development

**Options:** normal, abnormal, unobservable,

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## Homeostasis/metabolism IMPC_GEO_024_001 | v1.0

simpleParameter

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

**Description:** homeostasis_metabolism

**Options:** normal, abnormal, unobservable,

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## Integument IMPC_GEO_027_001 | v1.0

simpleParameter

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

**Description:** integument

**Options:** normal, abnormal, unobservable,

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## Vibrissa Morphology IMPC_GEO_028_001 | v1.0

simpleParameter

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

**Description:** vibrissa_morphology

**Options:** normal, abnormal, unobservable,

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## Skin Appearance IMPC_GEO_029_001 | v1.0

simpleParameter

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

**Description:** skin_appearance

**Options:** normal, abnormal, unobservable,

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## Skin Coloration IMPC_GEO_030_001 | v1.0

simpleParameter

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

**Description:** skin_coloration

**Options:** normal, abnormal, unobservable,

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## Limb Bud Morphology IMPC_GEO_031_001 | v1.0

simpleParameter

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

**Description:** limb_bud_morphology

**Options:** normal, abnormal, unobservable,

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## Limb Plate Morphology IMPC_GEO_032_001 | v1.0

simpleParameter

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

**Description:** limb_plate_morphology

**Options:** normal, abnormal, unobservable,

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## Tail Morphology IMPC_GEO_033_001 | v1.0

simpleParameter

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

**Description:** tail_morphology

**Options:** normal, abnormal, unobservable,

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## Liver/Biliary IMPC_GEO_035_001 | v1.0

simpleParameter

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

**Description:** liver_biliary

**Options:** normal, abnormal, unobservable,

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## Liver Morphology IMPC_GEO_036_001 | v1.0

simpleParameter

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

**Description:** liver_morphology

**Options:** normal, abnormal, unobservable,

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## Liver Size IMPC_GEO_037_001 | v1.0

simpleParameter

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

**Description:** liver_size

**Options:** normal, abnormal, unobservable,

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## Nervous System IMPC_GEO_039_001 | v1.0

simpleParameter

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

**Description:** nervous_system

**Options:** normal, abnormal, unobservable,

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## Brain Development IMPC_GEO_040_001 | v1.0

simpleParameter

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

**Description:** brain_development

**Options:** normal, abnormal, unobservable,

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## Vision/Eye IMPC_GEO_044_001 | v1.0

simpleParameter

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

**Description:** vision_eye

**Options:** normal, abnormal, unobservable,

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## Eye Morphology IMPC_GEO_045_001 | v1.0

simpleParameter

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

**Description:** eye_morphology

**Options:** normal, abnormal, unobservable,

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## Eye Size IMPC_GEO_046_001 | v1.0

simpleParameter

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

**Description:** eye_size

**Options:** normal, abnormal, unobservable,

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## Comment on image IMPC_GEO_049_001 | v1.0

simpleParameter

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

**Description:** comment_on_image

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## Images IMPC_GEO_050_001 | v1.0

seriesMediaParameter

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

**Description:** images

**Increments:** Minimum 1

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## Experimenter ID IMPC_GEO_051_001 | v1.0

procedureMetadata

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

**Description:** experimenter_id

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## Equipment ID IMPC_GEO_052_001 | v1.0

procedureMetadata

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

**Description:** equipment_id

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## Equipment Manufacturer IMPC_GEO_053_001 | v1.0

procedureMetadata

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

**Description:** equipment_manufacturer

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## Equipment Model IMPC_GEO_054_001 | v1.0

procedureMetadata

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

**Description:** equipment_model

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## Fixative IMPC_GEO_055_001 | v1.0

procedureMetadata

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

**Description:** fixative

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## Time of Dissection IMPC_GEO_056_001 | v1.0

procedureMetadata

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

**Description:** time_of_dissection

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## Somite Stage IMPC_GEO_057_001 | v1.1

procedureMetadata

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

**Description:** somite_stage

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## Time of dark cycle start IMPC_GEO_058_001 | v1.0

procedureMetadata

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

**Description:** time_of_dark_cycle_start

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## Time of dark cycle end IMPC_GEO_059_001 | v1.0

procedureMetadata

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

**Description:** time_of_dark_cycle_end

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## Date equipment last calibrated IMPC_GEO_060_001 | v1.1

procedureMetadata

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

**Description:** date_equipment_last_calibrated

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## Absent heartbeat IMPC_GEO_007_002 | v2.0

simpleParameter

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

**Description:** absent_heartbeat

**Options:** yes, unobservable, no,

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## Hemorrhage IMPC_GEO_009_002 | v2.0

simpleParameter

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

**Description:** hemorrhage

**Options:** yes, unobservable, no,

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## Skin Hemorrhage IMPC_GEO_010_002 | v2.0

simpleParameter

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

**Description:** skin_hemorrhage

**Options:** yes, unobservable, no,

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## Facial Cleft IMPC_GEO_017_002 | v2.0

simpleParameter

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

**Description:** facial_cleft

**Options:** yes, unobservable, no,

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## Cleft Palate IMPC_GEO_018_002 | v2.0

simpleParameter

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

**Description:** cleft_palate

**Options:** yes, unobservable, no,

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## Hydrops fetalis (fetal adema) IMPC_GEO_025_002 | v2.0

simpleParameter

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

**Description:** hydrops_fetalis_fetal_adema

**Options:** yes, unobservable, no,

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## Gastroschisis (herniated abdominal wall) IMPC_GEO_026_002 | v2.0

simpleParameter

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

**Description:** gastroschisis_herniated_abdominal_wall

**Options:** yes, unobservable, no,

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## Polydactyly IMPC_GEO_034_002 | v2.0

simpleParameter

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

**Description:** polydactyly

**Options:** yes, unobservable, no,

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## Pale Liver IMPC_GEO_038_002 | v2.0

simpleParameter

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

**Description:** pale_liver

**Options:** yes, unobservable, no,

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## Exencephaly IMPC_GEO_041_002 | v2.0

simpleParameter

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

**Description:** exencephaly

**Options:** yes, unobservable, no,

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## Holoprosencephaly IMPC_GEO_042_002 | v2.0

simpleParameter

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

**Description:** holoprosencephaly

**Options:** yes, unobservable, no,

## spina bifida IMPC_GEO_043_002 | v2.0

simpleParameter

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

**Description:** spina_bifida

**Options:** yes, unobservable, no,

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## Microphthalmia IMPC_GEO_047_002 | v2.3

simpleParameter

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

**Description:** microphthalmia

**Options:** yes, unobservable, no,

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## Anophthalmia IMPC_GEO_048_002 | v2.2

simpleParameter

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

**Description:** anophthalmia

**Options:** yes, unobservable, no,

## Severely Dysmorphic IMPC_GEO_061_001 | v1.2

simpleParameter

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

**Options:** no, yes, unobservable,