Eye Morphology IMPC_EYE_003

Purpose

To detect abnormalities in eye morphology.

Experimental Design

- Minimum number of animals: 7M + 7F
- Age at test: Week 15
- Sex: We do not expect the results of this test to show sexual dimorphism

Procedure

1. Examine the anterior of both eyes (e.g. with slit lamp) and record any abnormalities
2. Test the iris/pupil light response
3. Image abnormal eyes as a minimum or all eyes if capacity permits
4. Dilate both eyes
5. Examine the anterior and posterior of both dilated eyes (e.g. with slit lamp and ophthalmoscope) and record any abnormalities
6. Image abnormal eyes as a minimum or all eyes if capacity permits

OCT:

1. Turn on the OCT and start the database
2. Anaesthetize mouse
3. Prepare mouse eyes with drops and place contact lens (focal length 10 mm) on the right eye
4. Enter mouse data in the “Create new patient file” area and switch to the “Acquisition” window
5. Move the OCT camera to the right position and activate measurement modus
6. Place mouse collaterally to the OCT camera on the right side of a platform that is fixed in front of the OCT lens
7. Search the contact lens in the live picture of the fundus image field and place the pupil of the mouse eye in the centre of the window
8. Move the OCT camera such that OCT lens and contact lens touch each other
9. Focus the fundus picture by slightly moving up/down or forward/backward
10. Save fundus images
11. Set the "Ref.Arm" ruler such that the section of the retina is placed in the centre of the blue rectangle
12. Set the mode of measurement on "vertical, horizontal line"
13. Move the blue horizontal line in the fundus image field to the optic nerve level
14. Save images of retinal sections
15. Move the OCT camera to the left position
16. Repeat measurement procedure for the left eye

Scheimpflug Imaging:

1. Turn on the Pentacam and start the patient data management
2. Apply one drop 0.5% Atropine to each mouse eye for pupil dilation
3. Enter mouse data in the “Patient” group box and switch to the Scan menu
4. Activate the “1 Picture” modus in the “Image Options” area
5. Move Pentacam to the right position
6. Hold the mouse on a platform such that the vertical LED 475 nm light slit is orientated in the center of the right eye ball
7. Guarantee optimal focus by using the fine adjustment software tool in the adjustment window
8. Start imaging manually by pressing the “Start Scan” button
9. Scheimpflug images are saved automatically
10. Move Pentacam to the left position
11. Repeat measurement procedure for the left eye

Notes

- As a minimum, all abnormalities should be imaged.
  - Where capacity permits, all mice can be imaged
- Majority of parameters can be analysed using the standard approach for assessing categorical data. To increase power for analysis purposes, where an abnormality is detected in the left, right or both eyes, the data may be combined to generate one "abnormal" category.

Data QC

Image QC is typically performed during data collection to ensure high quality images are captured whilst eyes are dilated etc.

Parameters and Metadata

**Eye** IMPC_EYE_001_001 | v1.0

*Description:* eye

*Options:* present, absent left eye, absent right eye, absent both eyes,
**Bulging eye** IMPC_EYE_002_001 | v1.0

*simpleParameter*

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

**Description:** bulging_eye

**Options:** absent, no data left eye, no data right eye, present left eye, present right eye, present both eyes, no data for both eyes, no data left eye, present right eye, no data right eye, present left eye,

**Eye Hemorrhage or Blood Presence** IMPC_EYE_003_001 | v1.0

*simpleParameter*

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

**Description:** eye_hemorrhage_or_blood_presence

**Options:** absent, no data left eye, no data right eye, present left eye, present right eye, present both eyes, no data for both eyes, no data left eye, present right eye, no data right eye, present left eye,

**Eyelid morphology** IMPC_EYE_004_001 | v1.0

*simpleParameter*

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

**Options:** normal, no data left eye, no data right eye, left eye abnormal, right eye abnormal, both eyes abnormal, no data for both eyes, no data left eye, right eye abnormal, no data right eye, left eye abnormal,

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**Eyelid closure** IMPC_EYE_005_001 | v1.0

*simpleParameter*

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

**Description:** eyelid_closure

**Options:** normal, no data left eye, no data right eye, left eye closed, right eye closed, both eyes closed, no data for both eyes, no data left eye, right eye closed, no data right eye, left eye closed,

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**Narrow eye opening** IMPC_EYE_006_001 | v1.0

*simpleParameter*

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

**Description:** narrow_eye_opening

**Options:** normal, no data left eye, no data right eye, left eye abnormal, right eye abnormal, both eyes abnormal, no data for both eyes, no data left eye, right eye abnormal, no data right eye, left eye abnormal,
**Cornea** IMPC_EYE_007_001 | v1.0

*simpleParameter*

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

**Description:** cornea

**Options:** normal, no data left eye, no data right eye, left eye abnormal, right eye abnormal, both eyes abnormal, no data for both eyes, no data left eye, right eye abnormal, no data right eye, left eye abnormal,

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**Corneal opacity** IMPC_EYE_008_001 | v1.0

*simpleParameter*

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

**Description:** corneal_opacity

**Options:** absent, no data left eye, no data right eye, present left eye, present right eye, present both eyes, no data for both eyes, no data left eye, present right eye, no data right eye, present left eye,

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**Corneal vascularization** IMPC_EYE_009_001 | v1.0

*simpleParameter*

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

**Description:** corneal_vascularization
**Options:** absent, no data left eye, no data right eye, present left eye, present right eye, present both eyes, no data for both eyes, no data left eye, present right eye, no data right eye, present left eye,
**SimpleParameter**

**Description:** pupil_shape

**Options:** normal, no data left eye, no data right eye, left eye abnormal, right eye abnormal, both eyes abnormal, no data for both eyes, no data left eye, right eye abnormal, no data right eye, left eye abnormal,

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**Pupil Dilation** IMPC_EYE_013_001 | v1.0

**SimpleParameter**

**Description:** pupil_dilation

**Options:** normal, no data left eye, no data right eye, left eye dilated, right eye dilated, both eyes dilated, no data for both eyes, no data left eye, right eye dilated, no data right eye, left eye dilated,

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**Pupil Light Response** IMPC_EYE_014_001 | v1.0

**SimpleParameter**

**Description:** pupil_light_response
Options: normal, no data left eye, no data right eye, left eye abnormal, right eye abnormal, both eyes abnormal, no data for both eyes, no data left eye, right eye abnormal, no data right eye, left eye abnormal,
**Lens Opacity**  IMPC_EYE_017_001 | v1.0

simpleParameter

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

**Description:** lens_opacity

**Options:** absent, no data left eye, no data right eye, present left eye, present right eye, present both eyes, no data for both eyes, no data left eye, present right eye, no data right eye, present left eye,

**Fusion between cornea and lens**  IMPC_EYE_018_001 | v1.0

simpleParameter

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

**Description:** fusion_between_cornea_and_lens

**Options:** absent, no data left eye, no data right eye, present left eye, present right eye, present both eyes, no data for both eyes, no data left eye, present right eye, no data right eye, present left eye,

**Synechia**  IMPC_EYE_019_001 | v1.0

simpleParameter

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

**Description:** synechia
Options: absent, no data left eye, no data right eye, present left eye, present right eye, present both eyes, no data for both eyes, no data left eye, present right eye, no data right eye, present left eye,

Optic Disc  IMPC_EYE_023_001 | v1.0

simpleParameter


Description: optic_disc

Options: normal, no data left eye, no data right eye, left eye abnormal, right eye abnormal, both eyes abnormal, no data for both eyes, no data left eye, right eye abnormal, no data right eye, left eye abnormal,

Retinal Blood Vessels  IMPC_EYE_024_001 | v1.0

simpleParameter


Description: retinal_blood_vessels

Options: normal, no data left eye, no data right eye, left eye abnormal, right eye abnormal, both eyes abnormal, no data for both eyes, no data left eye, right eye abnormal, no data right eye, left eye abnormal,
Retinal Blood Vessels Structure IMPC_EYE_025_001 | v1.0

```
Description: retinal_blood_vessels_structure
Options: normal, no data left eye, no data right eye, left eye abnormal, right eye abnormal, both eyes abnormal, no data for both eyes, no data left eye, right eye abnormal, no data right eye, left eye abnormal,
```

Retinal Blood Vessels Pattern IMPC_EYE_026_001 | v1.0

```
Description: retinal_blood_vessels_pattern
Options: normal, no data left eye, no data right eye, left eye abnormal, right eye abnormal, both eyes abnormal, no data for both eyes, no data left eye, right eye abnormal, no data right eye, left eye abnormal,
```

Persistence of hyaloid vascular system IMPC_EYE_027_001 | v1.0

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Description: persistence_of_hyaloid_vascular_system
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Options: absent, no data left eye, no data right eye, present left eye, present right eye, present both eyes, no data for both eyes, no data left eye, present right eye, no data right eye, present left eye,

Slit Lamp observation IMPC_EYE_028_001 | v1.1
simpleParameter


Description: slit_lamp_observation

Ophthalmoscope Observation IMPC_EYE_029_001 | v1.1
simpleParameter


Description: ophthalmoscope_observation

Slit Lamp Equipment ID IMPC_EYE_030_001 | v1.2
procedureMetadata


Description: slit_lamp_equipment_id
**Slit Lamp Equipment Manufacturer**  IMPC_EYE_031_001 | v1.2

**procedureMetadata**


Description: slit_lamp_equipment_manufacturer

Options: Zeiss, Haag-Streit, MuLe, Kowa, CSO, Phoenix Research Labs, Topcon,

**Slit Lamp Equipment Model**  IMPC_EYE_032_001 | v1.2

**procedureMetadata**


Description: slit_lamp_equipment_model


**Ophthalmoscope Equipment ID**  IMPC_EYE_033_001 | v1.2

**procedureMetadata**


Description: ophthalmoscope_equipment_id
Ophthalmoscope Equipment Manufacturer IMPC_EYE_034_001 | v1.2

Description: ophthalmoscope_equipment_manufacturer

Options: Haag-Streit, Heine, Phoenix, Kowa, Karl Storz / Nikon, Phoenix Research Labs, Heine / Volk, Keeler LTD,

Ophthalmoscope Equipment Model IMPC_EYE_035_001 | v1.2

Description: ophthalmoscope_equipment_model

Options: Sigma 150K, Omega 500 Unplugged, Micron III, Genesis-D, OMEGA 180 / Superfield NC, Xenon Nova 175W light source + HOPKINS optic 1218AA /Nikon D5100 + 85 mm f/1.8 lens, Omega 180 / 60D, SL4 4AA, Genesis, Genesis-DF, Micron IV, Omega 500 / 60D,

Experimenter ID IMPC_EYE_036_001 | v1.1
**Optical Coherence Tomography Equipment ID**  IMPC_EYE_037_001 | v1.1

**Procedure Metadata**

**Description:** optical_coherence_tomography_equipment_id

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**Optical Coherence Tomography Equipment Manufacturer**  IMPC_EYE_038_001 | v1.2

**Procedure Metadata**

**Description:** optical_coherence_tomography_equipment_manufacturer

**Options:** Bioptigen, Heidelberg Engineering,

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**Optical Coherence Tomography Equipment Model**  IMPC_EYE_039_001 | v1.2
procedureMetadata

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

**Description:** optical_coherence_tomography_equipment_model

**Options:** EnvisuTM R-Series SDOIS, Envisu R2200, Spectralis, Envisu R2210,

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**Scheimpflug Equipment ID** IMPC_EYE_040_001 | v1.1

procedureMetadata

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

**Description:** scheimpflug_equipment_id

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**Scheimpflug Equipment Manufacturer** IMPC_EYE_041_001 | v1.4

procedureMetadata

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

**Description:** scheimpflug_equipment_manufacturer

**Options:** Oculus GmbH,

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**Scheimpflug Equipment Model** IMPC_EYE_042_001 | v1.4

procedureMetadata
Description: scheimpflug_equipment_model

Options: Pentacam,

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**Dilation Method** IMPC_EYE_043_001 | v1.0

Description: dilation_method

Options: Atropine, Tropicamide, Tropicamide+Phenylephrin, None, Cyclopentolate hydrochloride, Phenylephrine hydrochloride, Atropine sulphate, Cyclopentolate hydrochloride+Phenylephrine hydrochloride,

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**Topical Anesthetic** IMPC_EYE_044_001 | v1.1

Description: topical_anesthetic

Options: Atropine, Oxybuprocain, No anesthesia, Mydriacyl, Phenylephrine hydrochloride, Hydrochloride, Atropine sulphate,
General Anesthetic  IMPC_EYE_045_001  |  v1.1

procedureMetadata


Description: general_anesthetic

Options: Ketamine+Xylazine, No anesthesia, Isoflurane, Euthatal, Avertin, Ketamine+Medetomidine, Zoletil,

Date Slit Lamp equipment last calibrated  IMPC_EYE_046_001  |  v1.1

procedureMetadata


Date Ophthalmoscope equipment last calibrated  IMPC_EYE_047_001  |  v1.1

procedureMetadata


Date Scheimpflug equipment last calibrated  IMPC_EYE_048_001  |  v1.1

procedureMetadata

Date OCT equipment last calibrated IMPC_EYE_049_001 | v1.1
procedureMetadata

Images Ophthalmoscopy IMPC_EYE_050_001 | v1.1
seriesMediaParameter

Images Slit Lamp IMPC_EYE_051_001 | v1.1
seriesMediaParameter

Sheimpflug Lens description IMPC_EYE_052_001 | v1.1
simpleParameter
Scheimpflug description IMPC_EYE_053_001 | v1.0


Min left eye lens density IMPC_EYE_054_001 | v1.2

Unit Measured: %

Max left eye lens density IMPC_EYE_055_001 | v1.1

Unit Measured: %

Mean left eye lens density IMPC_EYE_056_001 | v1.1

Min right eye lens density  IMPC_EYE_057_001 | v1.1
simpleParameter

Max right eye lens density  IMPC_EYE_058_001 | v1.1
simpleParameter

Mean right eye lens density  IMPC_EYE_059_001 | v1.1
simpleParameter
**Right corneal thickness** IMPC_EYE_060_001 | v1.2  
*simpleParameter*

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

**Unit Measured:** um

**Right anterior chamber depth** IMPC_EYE_061_001 | v1.2  
*simpleParameter*

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

**Unit Measured:** um

**Right total retinal thickness** IMPC_EYE_062_001 | v1.2  
*simpleParameter*

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

**Unit Measured:** um
**Right inner nuclear layer**  IMPC_EYE_063_001 | v1.2

simpleParameter

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

Unit Measured: um

**Right outer nuclear layer**  IMPC_EYE_064_001 | v1.2

simpleParameter

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

Unit Measured: um

**Right posterior chamber depth**  IMPC_EYE_065_001 | v1.2

simpleParameter

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

Unit Measured: um

**Left corneal thickness**  IMPC_EYE_066_001 | v1.2

simpleParameter

Req. Analysis: false  
Req. Upload: false  
Is Annotated: true
**Left anterior chamber depth**  IMPC_EYE_067_001 | v1.2

*simpleParameter*

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

Unit Measured: um

**Left total retinal thickness**  IMPC_EYE_068_001 | v1.2

*simpleParameter*

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

Unit Measured: um

**Left inner nuclear layer**  IMPC_EYE_069_001 | v1.2

*simpleParameter*

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

Unit Measured: um
**Left outer nuclear layer** IMPC_EYE_070_001 | v1.2

`simpleParameter`

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

**Unit Measured:** um

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**Left posterior chamber depth** IMPC_EYE_071_001 | v1.2

`simpleParameter`

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

**Unit Measured:** um

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**B-scan of right retina** IMPC_EYE_072_001 | v1.1

`seriesMediaParameter`

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

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**B-scan of left retina** IMPC_EYE_073_001 | v1.1

`seriesMediaParameter`

- **Req. Analysis:** false
- **Req. Upload:** false
- **Is Annotated:** false
VIP of right fundus IMPC_EYE_074_001 | v1.1
seriesMediaParameter


VIP of left fundus IMPC_EYE_075_001 | v1.1
seriesMediaParameter


B-scan of right cornea and lens IMPC_EYE_076_001 | v1.1
seriesMediaParameter


B-scan of left cornea and lens IMPC_EYE_077_001 | v1.1
seriesMediaParameter

VIP of right eye IMPC_EYE_078_001 | v1.1
seriesMediaParameter

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

VIP of left eye IMPC_EYE_079_001 | v1.1
seriesMediaParameter

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

Corneal Sclerization IMPC_EYE_080_001 | v1.1
simpleParameter

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

Options: absent, no data left eye, no data right eye, no data for both eyes, present left eye, present right eye, present both eyes, no data left eye, present right eye, no data right eye, present left eye,

Corneal deposits IMPC_EYE_081_001 | v1.1
simpleParameter

Req. Analysis: false
Req. Upload: false
Is Annotated: true
Options: absent, no data left eye, no data right eye, no data for both eyes, present left eye, present right eye, present both eyes, no data left eye, present right eye, no data right eye, present left eye,

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**Iris transilumination** IMPC_EYE_082_001 | v1.1

*simpleParameter*

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

Options: normal, no data left eye, no data right eye, no data for both eyes, left eye abnormal, right eye abnormal, both eyes abnormal, no data left eye, right eye abnormal, no data right eye, left eye abnormal,

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**Vitreous** IMPC_EYE_083_001 | v1.1

*simpleParameter*

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

Options: normal, no data left eye, no data right eye, no data for both eyes, left eye abnormal, right eye abnormal, both eyes abnormal, no data left eye, right eye abnormal, no data right eye, left eye abnormal,

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**Corneal mineralization** IMPC_EYE_084_001 | v1.0

*simpleParameter*

**Req. Analysis:** false  **Req. Upload:** false  **Is Annotated:** true
**Options:** absent, present left eye, present right eye, present both eyes, no data left eye, no data right eye, no data for both eyes, no data left eye, present right eye, no data right eye, present left eye,

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**Corneal ulcer** IMPC_EYE_085_001 | v1.0

simpleParameter

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

**Options:** absent, present left eye, present right eye, present both eyes, no data left eye, no data right eye, no data for both eyes, no data left eye, present right eye, no data right eye, present left eye,

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**Lacrimation** IMPC_EYE_086_001 | v1.0

simpleParameter

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

**Options:** absent, present left eye, present right eye, present both eyes, no data left eye, no data right eye, no data for both eyes, no data left eye, present right eye, no data right eye, present left eye,

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**Right vitreous humor thickness** IMPC_EYE_087_001 | v1.0

simpleParameter
Left vitreous humour thickness IMPC_EYE_088_001 | v1.0

Unit Measured: um

Ophthalmoscope Lens Model IMPC_EYE_089_001 | v1.1

Unit Measured: mm

Right eye diameter IMPC_EYE_090_001 | v1.0

Unit Measured: mm
**Left eye diameter** IMPC_EYE_091_001 | v1.0

*simpleParameter*

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

**Unit Measured:** mm

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**Retina (combined)** IMPC_EYE_092_002 | v2.0

*simpleParameter*

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

**Options:** normal, no data left eye, no data right eye, left eye abnormal, right eye abnormal, both eyes abnormal, no data for both eyes, no data left eye, right eye abnormal, no data right eye, left eye abnormal,