Combined SHIRPA and Dysmorphology IMP C_CSD_002

Purpose

SHIRPA and dysmorphology were originally always separate assessments. However they have recently been combined as assessments, so that they take place at the same time.

The purpose of the assessments is to examine mice for obvious physical characteristics, behaviors and morphological abnormalities.

Descriptions include abnormal locomotion/appearance/behavior/reflex reactions.

Experimental Design

- **Minimum number of animals**: 7M + 7F
- **Age at test**: Week 9
- **Sex**: We would expect the results of this test to show sexual dimorphism

Equipment

- Viewing Jar
- SHIRPA arena
- Grid above arena
- Click Box
- Geotaxis grid
- Tube for contact righting
- Photo and/or video camera

Procedure

1. Allow the mice to acclimatise to the phenotyping room for a period of 30 minutes prior to testing.
2. Throughout the test note any vocalisation, aggression, salivation or unexpected behaviours.
3. During this test, note any unexpected dysmorphological characteristics (morphological irregularities are recorded by video sequences or photos).
4. Place the mouse in a clear cylinder over a wire grid and observe for activity and tremors.
5. Transfer the mouse out of the cylinder by removing the metal plate/grid whilst positioning 30cm over an arena and record the transfer arousal.
6. Record the number of 10cm² squares the mouse moves into in the first 30 seconds in the arena (locomotor activity).
7. Allow the mouse to move freely around the arena whilst being observed for gait and tail elevation.
8. Hold the click box approximately 30cm above the arena and press the button, record the response of the mouse.
9. Approach the mouse from the front with a bent finger, aiming to touch the mouse on the back of the neck rather than on the face. Ensure the mouse is looking at the finger before approach is started. Record whether the mouse moves away before the finger touches the mouse, when the finger touches the mouse or if the mouse does not move at all.
10. Pick up the mouse by the tail and observe for limp grasping and trunk curl. Trunk curl must only be recorded if the mouse curls forward without twisting its body, bending to one side is not scored as a trunk curl.
11. Place the mouse in a small transparent tube. Turn the tube quickly so the mouse is fully upside down and record if the mouse rights itself.
12. Record any vocalisation and/or aggression which were observed throughout the entire test.

Notes

1. If wiping down with ethanol prior to the use of equipment, make sure no ethanol residue remains as the ethanol may affect the behaviour of the animals.
2. The validity of results obtained from behavioural phenotyping is largely dependent on methods of animal husbandry. It is important that individuals following this procedure are experienced and aware of the animal’s welfare, and is familiar with the animal being tested, in order to reduce the anxiety levels of the animal prior to testing.
3. The majority of mouse behavioural studies are age/sex/strain dependent. It is important to keep these parameters comparable throughout a single experiment.
4. Environmental factors may contribute to the levels of anxiety within the mouse. The temperature, humidity, ventilation, noise intensity and light intensity must be maintained at levels appropriate for mice. It is essential that the mice be kept in a uniform environment before and after testing to avoid anomalous results being obtained.
5. It is recommended that all phenotyping experimentation is conducted at approximately the same time of day because physiological and biochemical parameters change throughout the day.
6. When a number of mice are tested continuously, residual odours from the equipment used in the preceding test may affect the test results. The floor and walls of the arena, ruler, and metal net should be wiped clean before introducing the next mouse. To prevent infection, the equipment should be washed with water at the completion of the day’s tests. Some specific pathogen-free facilities use ultraviolet irradiation when tests are not being performed. Care needs to be taken, however, to ensure that ultraviolet irradiation does not crack any acrylate equipment covered with residual alcohol.

Parameters and Metadata

**Tail - presence** IMPC_CSD_001_001 | v1.1

simpleParameter
**Description:** tail_presence

**Options:** Absent, Present,

---

**Tail - length** IMPC_CSD_002_001 | v1.1

**simpleParameter**

**Description:** tail_length

**Options:** Long, Short, As expected, No data,

---

**Tail - thickness** IMPC_CSD_003_001 | v1.1

**simpleParameter**

**Description:** tail_thickness

**Options:** Increased, Decreased, As expected, No data,

---

**Tail - morphology** IMPC_CSD_004_001 | v1.1
**simpleParameter**

**Description:** tail_morphology

**Options:** As expected, Not as expected, No data,

---

**Coat - color - back** IMPC_CSD_005_001 | v1.0

**simpleParameter**

**Description:** coat_color_back

**Options:** As expected, Not as expected, No data,

---

**Coat - color - head** IMPC_CSD_006_001 | v1.0

**simpleParameter**

**Description:** coat_color_head

**Options:** As expected, Not as expected, No data,
Coat - color - abdomen IMPC_CSD_007_001 | v1.0


Description: coat_color_abdomen

Options: As expected, Not as expected, No data,

Coat - color pattern - back IMPC_CSD_008_001 | v1.0


Description: coat_color_pattern_back

Options: As expected, Not as expected, No data,

Coat - color pattern - head IMPC_CSD_009_001 | v1.0


Description: coat_color_pattern_head

Options: As expected, Not as expected, No data,
Coat - color pattern - abdomen | IMPC_CSD_010_001 | v1.0

**simpleParameter**

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

**Description:** coat_color_pattern_abdomen

**Options:** As expected, Not as expected, No data

---

Coat - hair distribution - back | IMPC_CSD_011_001 | v1.0

**simpleParameter**

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

**Description:** coat_hair_distribution_back

**Options:** As expected, Not as expected

---

Coat - hair distribution - head | IMPC_CSD_012_001 | v1.0

**simpleParameter**

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

**Description:** coat_hair_distribution_head

**Options:** As expected, Not as expected
Coat - hair distribution - abdomen  IMPC_CSD_013_001 | v1.0

**simpleParameter**

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

**Description:** coat_hair_distribution_abdomen

**Options:** As expected, Not as expected,

---

Coat - hair texture / appearance - back  IMPC_CSD_014_001 | v1.0

**simpleParameter**

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

**Description:** coat_hair_texture_appearance_back

**Options:** As expected, Not as expected, No data,

---

Coat - hair texture / appearance - head  IMPC_CSD_015_001 | v1.0

**simpleParameter**

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

**Description:** coat_hair_texture_appearance_head

**Options:** As expected, Not as expected, No data,
Coat - hair texture / appearance - abdomen IMPC_CSD_016_001
| v1.0

description: coat_hair_texture_appearance_abdomen

Options: As expected, Not as expected, No data,

Forelimbs - position IMPC_CSD_017_001 | v1.0

description: forelimbs_position

Options: As expected, One forelimb only - not as expected, Both forelimbs - not as expected,

Forelimbs - shape IMPC_CSD_018_001 | v1.0

description: forelimbs_shape

Options: As expected, One forelimb only - not as expected, Both forelimbs - not as expected,
Forelimbs - size IMPC_CSD_019_001 | v1.0

simpleParameter


Description: forelimbs_size

Options: As expected, One forelimb only - increased, One forelimb only - decreased, Both forelimbs - increased, Both forelimbs - decreased,

Hindlimbs - position IMPC_CSD_020_001 | v1.1

simpleParameter


Description: hindlimbs_position

Options: As expected, One hindlimb only - not as expected, Both hindlimbs - not as expected,

Hindlimbs - shape IMPC_CSD_021_001 | v1.1

simpleParameter


Description: hindlimbs_shape
**Hindlimbs - size**  IMPC_CSD_022_001 | v1.1

*simpleParameter*

<table>
<thead>
<tr>
<th>Req. Analysis</th>
<th>Req. Upload</th>
<th>Is Annotated</th>
</tr>
</thead>
<tbody>
<tr>
<td>false</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

**Description:** hindlimbs_size

**Options:** As expected, One hindlimb only - increased, One hindlimb only - decreased, Both hindlimbs - increased, Both hindlimbs - decreased,

---

**Vibrissae - presence**  IMPC_CSD_023_001 | v1.0

*simpleParameter*

<table>
<thead>
<tr>
<th>Req. Analysis</th>
<th>Req. Upload</th>
<th>Is Annotated</th>
</tr>
</thead>
<tbody>
<tr>
<td>false</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

**Description:** vibrissae_presence

**Options:** As expected, Not as expected,
Description: vibrissae_appearance
Options: As expected, Not as expected, No data,

Head size IMPC_CSD_025_001 | v1.0
simpleParameter

Description: head_size
Options: As expected, Increased, Decreased,

Head morphology IMPC_CSD_026_001 | v1.0
simpleParameter

Description: head_morphology
Options: As expected, Not as expected,

Ears IMPC_CSD_027_001 | v1.0
simpleParameter
Description: ears
Options: As expected, Not as expected,

Snout size  IMPC_CSD_028_001 | v1.0
simpleParameter

Description: snout_size
Options: As expected, Increased, Decreased,

Activity (body position)  IMPC_CSD_029_001 | v1.0
simpleParameter

Description: activity_body_position_
Options: As expected, Increased activity, Inactive,

Tremor  IMPC_CSD_030_001 | v1.0
simpleParameter

**Tremor**

- **Description:** tremor
- **Options:** Absent, Present,
Gait IMPC_CSD_033_001 | v1.0

simpleParameter


Description: gait

Options: Fluid movement, Lack of fluidity in movement,

Tail elevation IMPC_CSD_034_001 | v1.2

simpleParameter


Description: tail_elevation

Options: As expected, Straub / elevated tail, Dragging, No data,

Touch escape IMPC_CSD_035_001 | v1.2

simpleParameter


Description: touch_escape

Options: No response, Response to touch, Flees prior to touch,
**Startle response**  IMPC_CSD_036_001 | v1.1

*simpleParameter*

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

**Description:** startle_response

**Options:** None, Present, No data,

---

**Unexpected behaviors**  IMPC_CSD_037_001 | v1.0

*simpleParameter*

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

**Description:** unexpected_behaviors

**Options:** None, Circling, Jumping, Retropulsion, Other,

---

**Trunk curl**  IMPC_CSD_038_001 | v1.0

*simpleParameter*

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

**Description:** trunk_curl

**Options:** Absent, Present, No data,
Limb grasp  IMPC_CSD_039_001 | v1.0

simpleParameter


Description: limb_grasp

Options: Absent, Present, No data,

Forelimb digit - size  IMPC_CSD_046_001 | v1.1

simpleParameter


Description: forelimb_digit_size

Options: As expected, One forelimb - increased size, One forelimb - decreased size, One forelimb - fused, Both forelimbs - increased size, Both forelimbs - decreased size, Both forelimbs - fused,

Hindlimb digit - size  IMPC_CSD_047_001 | v1.2

simpleParameter


Description: hindlimb_digit_size
Options: As expected, One hindlimb - increased size, One hindlimb - decreased size, One hindlimb - fused, Both hindlimbs - increased size, Both hindlimbs - decreased size, Both hindlimbs - fused,

**Skin color - whole body** IMPC_CSD_056_001 | v1.0

*simpleParameter*

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

**Description:** skin_color_whole_body

**Options:** As expected, Not as expected,

**Skin color - snout** IMPC_CSD_057_001 | v1.0

*simpleParameter*

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

**Description:** skin_color_snout

**Options:** As expected, Not as expected,

**Skin color - ear** IMPC_CSD_058_001 | v1.0

*simpleParameter*
Skin color - ear

Description: skin_color_ear
Options: As expected, Not as expected,

Skin color - front paws

Description: skin_color_front_paws
Options: As expected, Not as expected,

Skin color - back paws

Description: skin_color_back_paws
Options: As expected, Not as expected,

Skin color - tail
Description: skin_color_tail
Options: As expected, Not as expected, No data,

Skin texture - whole body IMPC_CSD_062_001 | v1.0

Description: skin_texture_whole_body
Options: As expected, Not as expected,

Skin texture - snout IMPC_CSD_063_001 | v1.0

Description: skin_texture_snout
Options: As expected, Not as expected,

Skin texture - ear IMPC_CSD_064_001 | v1.0

simpleParameter
Skin texture - ear

Description: skin_texture_ear
Options: As expected, Not as expected,

Skin texture - front paws IMPC_CSD_065_001 | v1.0

Description: skin_texture_front_paws
Options: As expected, Not as expected,

Skin texture - back paws IMPC_CSD_066_001 | v1.0

Description: skin_texture_back_paws
Options: As expected, Not as expected,

Skin texture - tail IMPC_CSD_067_001 | v1.0
simpleParameter


Description: skin_texture_tail

Options: As expected, Not as expected, No data,

---

**Teeth presence** IMPC_CSD_068_001 | v1.0

simpleParameter


Description: teeth_presence

Options: As expected, Not as expected,

---

**Upper teeth appearance** IMPC_CSD_069_001 | v1.0

simpleParameter


Description: upper_teeth_appearance

Options: As expected, Not as expected, No data,
Lower teeth appearance  IMPC_CSD_070_001 | v1.0


Description: lower_teeth_appearance

Options: As expected, Not as expected, No data,

Genitalia - presence  IMPC_CSD_071_001 | v1.1


Description: genitalia_presence

Options: As expected, Absent,

Genitalia - size  IMPC_CSD_072_001 | v1.1


Description: genitalia_size

Options: As expected, Not as expected, No data,
**Genitalia - morphology** IMPC_CSD_073_001 | v1.1

*simpleParameter*

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

Description: genitalia_morphology

Options: As expected, Not as expected, No data,

---

**Mouth morphology** IMPC_CSD_074_001 | v1.0

*simpleParameter*

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

Description: mouth_morphology

Options: As expected, Not as expected,

---

**Upper lip morphology** IMPC_CSD_075_001 | v1.0

*simpleParameter*

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

Description: upper_lip_morphology

Options: As expected, Not as expected,
**Lower lip morphology** IMPC_CSD_076_001 | v1.0

simpleParameter


Description: lower_lip_morphology

Options: As expected, Not as expected,

**Contact righting** IMPC_CSD_077_001 | v1.0

simpleParameter


Description: contact_righting

Options: Present, Absent, No data,

**Vocalization** IMPC_CSD_078_001 | v1.0

simpleParameter


Description: vocalization

Options: As expected, Not as expected,
Aggression IMPC_CSD_079_001 | v1.0
simpleParameter

**Description:** aggression

**Options:** As expected, Excessive aggression,

Head bobbing IMPC_CSD_080_001 | v1.0
simpleParameter

**Description:** head_bobbing

**Options:** Present, Absent,

Experimenter ID IMPC_CSD_081_001 | v1.0
procedureMetadata

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

**Description:**

Location of test IMPC_CSD_082_001 | v1.1
procedureMetadata

**Req. Analysis:** false  **Req. Upload:** true  **Is Annotated:** false
Number of animals in cage IMPC_CSD_083_001 | v1.2

Description: number_of_animals

Number of days since cage changed IMPC_CSD_084_001 | v1.1

Description: number_of_days_since_cage_changed

Images IMPC_CSD_085_001 | v1.1
**Size of squares in arena** IMPC_CSD_086_001 | v1.0

Procedure Metadata

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

**Unit Measured:** cm^2

**Comments (in English)** IMPC_CSD_087_001 | v1.2

Simple Parameter

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

**Description:** General comments, in English

**Forepaw - size** IMPC_CSD_040_002 | v2.0

Simple Parameter

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

**Description:** forepaw_size

**Options:** As expected, One forepaw - decreased, Both forepaws - increased, Both forepaws - decreased, One forepaw - increased,
**Hindpaw - size** IMPC_CSD_041_002 | v2.0

**simpleParameter**

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

**Description:** hindpaw_size

**Options:** As expected, One hindpaw - increased, One hindpaw - decreased, Both hindpaws - increased, Both hindpaws - decreased,

---

**Forepaw - shape** IMPC_CSD_042_002 | v2.0

**simpleParameter**

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

**Description:** forepaw_shape

**Options:** As expected, One forepaw - not as expected, Both forepaws - not as expected,

---

**Hindpaw - shape** IMPC_CSD_043_002 | v2.0

**simpleParameter**

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

**Description:** hindpaw_shape

**Options:** As expected, One hindpaw - not as expected, Both hindpaws - not as expected,
**Forelimb digit - number**  IMPC_CSD_044_002 | v2.0

simpleParameter


Description: forelimb_digit_number

Options: As expected, One forelimb - increased number, One forelimb - decreased number, Both forelimbs - increased number, Both forelimbs - decreased number,

**Hindlimb digit - number**  IMPC_CSD_045_002 | v2.0

simpleParameter


Description: hindlimb_digit_number

Options: As expected, One hindlimb - increased number, One hindlimb - decreased number, Both hindlimbs - increased number, Both hindlimbs - decreased number,

**Forelimb digit - shape**  IMPC_CSD_048_002 | v2.0

simpleParameter


Description: forelimb_digit_shape

Options: As expected, One forelimb - not as expected, Both forelimbs - not as expected,
Hindlimb digit - shape  IMPC_CSD_049_002 | v2.0


Description: hindlimb_digit_shape

Options: As expected, One hindlimb - not as expected, Both hindlimbs - not as expected,

Forelimb nail - number  IMPC_CSD_050_002 | v2.0


Description: forelimb_nail_number

Options: As expected, One forelimb - increased number, One forelimb - decreased number, Both forelimbs - increased number, Both forelimbs - decreased number, No data,

Hindlimb nail - number  IMPC_CSD_051_002 | v2.0


Description: hindlimb_nail_number
**Hindlimb nail - length** IMPC_CSD_053_002 | v2.0

*simpleParameter*

*Description*: hindlimb_nail_length

*Options*: As expected, One hindlimb - increased number, One hindlimb - decreased number, Both hindlimbs - increased number, Both hindlimbs - decreased number, No data,

**Forelimb nail - length** IMPC_CSD_052_002 | v2.0

*simpleParameter*

*Description*: forelimb_nail_length

*Options*: As expected, One forelimb - increased length, One forelimb - decreased length, Both forelimbs - increased length, Both forelimbs - decreased length, No data,

**Forelimb nail - shape** IMPC_CSD_054_002 | v2.0

*simpleParameter*
Description: forelimb_nail_shape

Options: As expected, One forelimb - not as expected, Both forelimbs - not as expected, No data,

Hindlimb nail - shape  IMPC_CSD_055_002 | v2.0

Description: hindlimb_nail_shape

Options: As expected, One hindlimb - not as expected, Both hindlimbs - not as expected, No data,