**Combined SHIRPA and Dysmorphology IMP C_CSD_001**

**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,

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

*simpleParameter*

Description: tail_length
Options: Long, Short, As expected, No data,

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

*simpleParameter*

Description: tail_thickness
Options: Increased, Decreased, As expected, No data,

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

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**Description:** tail_morphology

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

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

simpleParameter

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**Description:** coat_color_back

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

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

simpleParameter

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**Description:** coat_color_head

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

SimpleParameter

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

**Description:** coat_color_abdomen

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

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Coat - color pattern - back IMPC_CSD_008_001 | v1.0

SimpleParameter

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

**Description:** coat_color_pattern_back

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

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Coat - color pattern - head IMPC_CSD_009_001 | v1.0

SimpleParameter

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

**Description:** coat_color_pattern_head

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

simpleParameter

**Description:** coat_color_pattern_abdomen

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

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

simpleParameter

**Description:** coat_hair_distribution_back

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

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

simpleParameter

**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
simpleParameter


Description: coat_hair_texture_appearance_abdomen

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

Forelimbs - position  IMPC_CSD_017_001 | v1.0
simpleParameter


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
simpleParameter


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*

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

Description: forelimbs_size

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

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**Hindlimbs - position** IMPC_CSD_020_001 | v1.1

*simpleParameter*

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

Description: hindlimbs_position

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

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**Hindlimbs - shape** IMPC_CSD_021_001 | v1.1

*simpleParameter*

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

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

**Hindlimbs - size** IMPC_CSD_022_001 | v1.1

*simpleParameter*


**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*


**Description:** vibrissae_presence

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

**Vibrissae - appearance** IMPC_CSD_024_001 | v1.0

*simpleParameter*
Description: vibrissae_appearance

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

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**Head size**  IMPC_CSD_025_001 | v1.0

simpleParameter

Description: head_size

Options: As expected, Increased, Decreased,

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**Head morphology**  IMPC_CSD_026_001 | v1.0

simpleParameter

Description: head_morphology

Options: As expected, Not as expected,

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**Ears**  IMPC_CSD_027_001 | v1.0

simpleParameter
Description: ears
Options: As expected, Not as expected,

Snout size IMPC_CSD_028_001 | v1.0

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

Activity (body position) IMPC_CSD_029_001 | v1.0

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

Tremor IMPC_CSD_030_001 | v1.0
**simpleParameter**

**Description:** tremor

**Options:** Absent, Present,

**Transfer arousal**  
IMPC_CSD_031_001 | v1.2

**simpleParameter**

**Description:** transfer_arousal

**Options:** As expected, Immediate movement, Extended freeze,

**Locomotor activity**  
IMPC_CSD_032_001 | v1.2

**simpleParameter**

**Unit Measured:** Squares crossed

**Description:** locomotor_activity
**Gait**  IMPC_CSD_033_001 | v1.0

simpleParameter

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

**Description:** gait

**Options:** Fluid movement, Lack of fluidity in movement,

**Tail elevation**  IMPC_CSD_034_001 | v1.2

simpleParameter

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

**Description:** tail_elevation

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

**Touch escape**  IMPC_CSD_035_001 | v1.2

simpleParameter

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

**Description:** touch_escape

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

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

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Unexpected behaviors  IMPC_CSD_037_001  | v1.0
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**Description:** unexpected_behaviors

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

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Trunk curl  IMPC_CSD_038_001  | v1.0
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**Description:** trunk_curl

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

`simpleParameter`

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

Description: limb_grasp

Options: Absent, Present, No data,

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**Forepaw - size** IMPC_CSD_040_001 | v1.1

`simpleParameter`

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

Description: forepaw_size

Options: As expected, One forepaw increased, One forepaw decreased,  
Both forepaws increased, Both forepaws decreased,

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**Hindpaw - size** IMPC_CSD_041_001 | v1.2

`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_001 | v1.1

simpleParameter


Description: forepaw_shape

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

Hindpaw - shape IMPC_CSD_043_001 | v1.2

simpleParameter


Description: hindpaw_shape

Options: As expected, One hindpaw not as expected, Both hindpaws not as expected,

Forelimb digit - number IMPC_CSD_044_001 | v1.1

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_001  v1.2

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 - size  IMPC_CSD_046_001  v1.1

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
**Hindlimb digit - size**

**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,

---

**Forelimb digit - shape** IMPC_CSD_048_001 | v1.1

**Description:** forelimb_digit_shape

**Options:** As expected, One forelimb not as expected, Both forelimbs not as expected,

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**Hindlimb digit - shape** IMPC_CSD_049_001 | v1.2

**Description:** hindlimb_digit_shape

**Options:** As expected, One hindlimb not as expected, Both hindlimbs not as expected,
Forelimb nail - number IMPC_CSD_050_001 | v1.1

simpleParameter

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_001 | v1.2

simpleParameter

Description: hindlimb_nail_number

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_001 | v1.1

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,
**Hindlimb nail - length** IMPC_CSD_053_001 | v1.2

**simpleParameter**

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

**Description:** hindlimb_nail_length

**Options:** As expected, One hindlimb increased length, One hindlimb decreased length, Both hindlimbs increased length, Both hindlimbs decreased length, No data.

---

**Forelimb nail - shape** IMPC_CSD_054_001 | v1.1

**simpleParameter**

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

**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_001 | v1.2

**simpleParameter**

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

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

Skin color - whole body  IMPC_CSD_056_001  | v1.0

Description: skin_color_whole_body

Options: As expected, Not as expected,

Skin color - snout  IMPC_CSD_057_001  | v1.0

Description: skin_color_snout

Options: As expected, Not as expected,

Skin color - ear  IMPC_CSD_058_001  | v1.0

Description: skin_color_ear

Options: As expected, Not as expected,
Skin color - ear

**Description:** skin_color_ear

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

---

Skin color - front paws  IMPC_CSD_059_001 | v1.0

**Description:** skin_color_front_paws

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

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Skin color - back paws  IMPC_CSD_060_001 | v1.0

**Description:** skin_color_back_paws

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

---

Skin color - tail  IMPC_CSD_061_001 | v1.0

**Description:** 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
simpleParameter

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

Skin texture - snout IMPC_CSD_063_001 | v1.0
simpleParameter

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

Skin texture - ear IMPC_CSD_064_001 | v1.0
simpleParameter
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**

**Teeth presence** IMPC_CSD_068_001 | v1.0

**simpleParameter**

**Upper teeth appearance** IMPC_CSD_069_001 | v1.0
**Lower teeth appearance** IMPC_CSD_070_001 | v1.0

*simpleParameter*

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

**Description:** lower_teeth_appearance

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

---

**Genitalia - presence** IMPC_CSD_071_001 | v1.1

*simpleParameter*

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

**Description:** genitalia_presence

**Options:** As expected, Absent,

---

**Genitalia - size** IMPC_CSD_072_001 | v1.1

*simpleParameter*

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

**Description:** genitalia_size

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

**Description:** genitalia_morphology

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

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Mouth morphology IMPC_CSD_074_001 | v1.0

**Description:** mouth_morphology

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

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Upper lip morphology IMPC_CSD_075_001 | v1.0

**Description:** upper_lip_morphology

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

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

Contact righting  IMPC_CSD_077_001  | v1.0

Description: contact_righting
Options: Present, Absent, No data,

Vocalization  IMPC_CSD_078_001  | v1.0

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,

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**Experimenter ID**  IMPC_CSD_081_001  |  v1.0

*procedureMetadata*

**Description:**

**Options:**

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**Location of test**  IMPC_CSD_082_001  |  v1.1

*procedureMetadata*

**Description:**

**Options:**
Description: location_of_test

Options: Open bench, LAF cabinet,

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**Number of animals in cage** IMPC_CSD_083_001 | v1.2

procedureMetadata

Description: number_of_animals

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**Number of days since cage changed** IMPC_CSD_084_001 | v1.1

procedureMetadata

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**Images** IMPC_CSD_085_001 | v1.1

seriesMediaParameter

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**Size of squares in arena** IMPC_CSD_086_001 | v1.0

**procedureMetadata**

**Unit Measured:** cm^2

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

**simpleParameter**

**Description:** General comments, in English