# Combined SHIRPA and Dysmorphology BCM_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.

The BCM-specific CSD procedure differs from the IMPC procedure in that the IMPC-mandatory parameter "Locomotor activity" (and associated metadata parameters) is not included in BCM's procedure, as BCM perform Open Field as standard instead.

## Experimental Design

- **Minimum number of animals :**  4M + 4F
- **Age at test:** Week 9
- **Sex:** We would expect the results of this test to show sexual dimorphism

## Equipment

- Viewing Jar
- Click Box
- Tube for contact righting
- Photo and/or video camera

## 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

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

**Description:** tail_presence

**Options:** Absent, Present,

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### Tail - length IMPC_CSD_002_001 | v1.1

simpleParameter

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

**Description:** tail_length

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

---

## Tail - thickness IMPC_CSD_003_001 | v1.1

simpleParameter

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

**Description:** tail_thickness

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

---

## Tail - morphology IMPC_CSD_004_001 | v1.1

simpleParameter

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

**Description:** tail_morphology

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

---

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

simpleParameter

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

**Description:** coat_color_back

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

---

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

simpleParameter

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

**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,

---

## 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,

---

## 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

**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

simpleParameter

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

**Description:** coat_hair_texture_appearance_abdomen

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

---

## Forelimbs - position IMPC_CSD_017_001 | v1.0

simpleParameter

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

**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

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

**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,

---

## 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,

---

## 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

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

**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

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

**Description:** vibrissae_presence

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

---

## Vibrissae - appearance IMPC_CSD_024_001 | v1.0

simpleParameter

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

**Description:** vibrissae_appearance

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

---

## Head size IMPC_CSD_025_001 | v1.0

simpleParameter

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

**Description:** head_size

**Options:** As expected, Increased, Decreased,

---

## Head morphology IMPC_CSD_026_001 | v1.0

simpleParameter

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

**Description:** head_morphology

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

---

## Ears IMPC_CSD_027_001 | v1.0

simpleParameter

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

**Description:** ears

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

---

## Snout size IMPC_CSD_028_001 | v1.0

simpleParameter

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

**Description:** snout_size

**Options:** As expected, Increased, Decreased,

---

## Activity (body position) IMPC_CSD_029_001 | v1.0

simpleParameter

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

**Description:** activity_body_position_

**Options:** As expected, Increased activity, Inactive,

---

## Tremor IMPC_CSD_030_001 | v1.0

simpleParameter

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

**Description:** tremor

**Options:** Absent, Present,

---

## Transfer arousal IMPC_CSD_031_001 | v1.2

simpleParameter

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

**Description:** transfer_arousal

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

---

## 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,

---

## 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

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

**Description:** limb_grasp

**Options:** Absent, Present, No data,

---

## Forelimb digit - size IMPC_CSD_046_001 | v1.1

simpleParameter

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

**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

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

**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

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

**Description:** skin_color_ear

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

---

## Skin color - front paws IMPC_CSD_059_001 | v1.0

simpleParameter

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

**Description:** skin_color_front_paws

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

---

## Skin color - back paws IMPC_CSD_060_001 | v1.0

simpleParameter

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

**Description:** skin_color_back_paws

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

---

## Skin color - tail IMPC_CSD_061_001 | v1.0

simpleParameter

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

**Description:** skin_color_tail

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

---

## Skin texture - whole body IMPC_CSD_062_001 | v1.0

simpleParameter

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

**Description:** skin_texture_whole_body

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

---

## Skin texture - snout IMPC_CSD_063_001 | v1.0

simpleParameter

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

**Description:** skin_texture_snout

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

---

## Skin texture - ear IMPC_CSD_064_001 | v1.0

simpleParameter

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

**Description:** skin_texture_ear

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

---

## Skin texture - front paws IMPC_CSD_065_001 | v1.0

simpleParameter

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

**Description:** skin_texture_front_paws

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

---

## Skin texture - back paws IMPC_CSD_066_001 | v1.0

simpleParameter

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

**Description:** skin_texture_back_paws

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

---

## Skin texture - tail IMPC_CSD_067_001 | v1.0

simpleParameter

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

**Description:** skin_texture_tail

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

---

## Teeth presence IMPC_CSD_068_001 | v1.0

simpleParameter

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

**Description:** teeth_presence

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

---

## Upper teeth appearance IMPC_CSD_069_001 | v1.0

simpleParameter

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

**Description:** upper_teeth_appearance

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

---

## 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

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

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

**Description:** lower_lip_morphology

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

---

## Contact righting IMPC_CSD_077_001 | v1.0

simpleParameter

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

**Description:** contact_righting

**Options:** Present, Absent, No data,

---

## Vocalization IMPC_CSD_078_001 | v1.0

simpleParameter

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

**Description:** vocalization

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

---

## Aggression IMPC_CSD_079_001 | v1.0

simpleParameter

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

**Description:** aggression

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

---

## Head bobbing IMPC_CSD_080_001 | v1.0

simpleParameter

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

**Description:** head_bobbing

**Options:** Present, Absent,

---

## Experimenter ID IMPC_CSD_081_001 | v1.0

procedureMetadata

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

---

## Location of test IMPC_CSD_082_001 | v1.1

procedureMetadata

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

**Description:** location_of_test

**Options:** Open bench, LAF cabinet,

---

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

procedureMetadata

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

**Description:** number_of_animals

---

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

procedureMetadata

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

---

## Images IMPC_CSD_085_001 | v1.1

seriesMediaParameter

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

---

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

simpleParameter

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

**Description:** General comments, in English

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## Forepaw - size IMPC_CSD_040_002 | v2.0

simpleParameter

**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

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

**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

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

**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

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

**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

simpleParameter

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

**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

simpleParameter

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

**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

simpleParameter

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

**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,

---

## Hindlimb nail - length IMPC_CSD_053_002 | v2.0

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 - length IMPC_CSD_052_002 | v2.0

simpleParameter

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

**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

**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_002 | v2.0

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,

---