



Combined SHIRPA and Dymorphology IMPC_CSD_003

Purpose

SHIRPA and dymorphology 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: 7 males and 7 females

Age at test: 9 weeks

Sex: Both (sexually dymorphic)

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 dymorphological 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

	Version	Type	Option	Unit	Data Type
Activity (body position) IMPC_CSD_029_001	1	simpleParameter	Inactive		TEXT
			As expected		
			Increased activity		
Tremor IMPC_CSD_030_001	1	simpleParameter	No shaking		TEXT
			Mild shaking		
			Marked shaking		
Transfer arousal IMPC_CSD_031_001	1	simpleParameter	Extended freeze		TEXT
			As expected		
			Immediate movement		

Locomotor activity IMPC_CSD_032_001	1.2	simpleParameter	Integer	Squares crossed	INT
Gait JMC_CSD_018_001	1	simpleParameter	Normal		TEXT
			Fluid but abnormal		
			Limited movement only		
			Incapacitated (unable to walk)		
Tail elevation IMPC_CSD_034_001	1	simpleParameter	Dragging		TEXT
			As expected		
			Straub/elevated tail		
Startle response JMC_CSD_035_001	1.1	simpleParameter	None		TEXT
			Preyer's reflex		
			Jump less than 1 cm		
			Jump more than 1 cm		
Touch escape IMPC_CSD_035_001	1.1	simpleParameter	No response		TEXT
			Mild		
			Moderate		
			Vigorous		
Positional passivity JMC_CSD_021_001	1	simpleParameter	Struggles when held by the tail		TEXT
			Struggles when held by the neck		
			Struggles when laid supine		
			Struggles when held by the hindlimb		
			No struggle		
Trunk curl IMPC_CSD_038_001	1	simpleParameter	Absent		TEXT
			Present		
Limb grasp IMPC_CSD_039_001	1	simpleParameter	Absent		TEXT
			Present		
Head size IMPC_CSD_025_001	1	simpleParameter	Decreased		TEXT
			As expected		
			Increased		
Head morphology IMPC_CSD_026_001	1	simpleParameter	As expected		TEXT
			Not as expected		

Snout size IMPC_CSD_028_001	1	simpleParameter	Decreased		TEXT
			As expected		
			Increased		
Ears JMC_CSD_017_001	1	simpleParameter	As expected		TEXT
			Absent		
			Uneven		
			Large		
			Small		
Toe pinch JMC_CSD_039_001	1	simpleParameter	None		TEXT
			Slight withdrawal		
			Moderate withdrawal, not brisk		
			Brisk, rapid withdrawal		
			Very brisk repeated extension and flexion		
Body length JMC_CSD_003_001	1	simpleParameter	Integer		INT
Tail - length JMC_CSD_036_001	1	simpleParameter	Integer		TEXT
Tail - presence IMPC_CSD_001_001	1.1	simpleParameter	Present		TEXT
			Absent		
Tail - length IMPC_CSD_002_001	1.1	simpleParameter	Short		TEXT
			As expected		
			Long		
Tail - thickness IMPC_CSD_003_001	1.1	simpleParameter	Decreased		TEXT
			As expected		
			Increased		
Tail - morphology JMC_CSD_037_001	1.1	simpleParameter	Normal		TEXT
			Kinked		
			Curled		
			Other abnormality		
Mouth morphology IMPC_CSD_074_001	1	simpleParameter	As expected		TEXT
			Not as expected		
Upper lip morphology IMPC_CSD_075_001	1	simpleParameter	As expected		TEXT
			Not as expected		
Lower lip morphology IMPC_CSD_076_001	1	simpleParameter	As expected		TEXT
			Not as expected		
Teeth presence	1	simpleParameter	As expected		TEXT

IMPC_CSD_068_001			Not as expected		
Upper teeth appearance JMC_CSD_040_001	1	simpleParameter	As expected		TEXT
			Overgrown		
			Small		
			Wide		
			Different colour		
Lower teeth appearance JMC_CSD_021_001	1	simpleParameter	As expected		TEXT
			Overgrown		
			Small		
			Wide		
			Different colour		
Salivation JMC_CSD_022_001		simpleParameter	None		TEXT
			Slight margin of sub-maxillary area		
			Wet zone entire sub-maxillary area		
Vibrissae - presence IMPC_CSD_023_001	1	simpleParameter	As expected		TEXT
			Not as expected		
Vibrissae - appearance JMC_CSD_041_001	1	simpleParameter	As expected		TEXT
			Long		
			Short		
			Curly		
Genitalia - presence IMPC_CSD_071_001	1.1	simpleParameter	As expected		TEXT
			Absent		
Genitalia - size JMC_CSD_019_001	1.1	simpleParameter	Small		TEXT
			As expected		
			Large		
Genitalia - morphology IMPC_CSD_073_001	1.1	simpleParameter	Not as expected		TEXT
			As expected		
Abdominal tone JMC_CSD_001_001			Increased resistance		TEXT
			As expected		
			Flaccid		
Limb tone JMC_CSD_020_001	1	simpleParameter	No resistance		TEXT
			Slight resistance		
			Moderate resistance		
			Marked resistance		
			Extreme resistance		

Forelimbs - position IMPC_CSD_017_001	1	simpleParameter	As expected		TEXT
			One forelimb only not as expected		
			Both forelimbs - not as expected		
Forelimbs - shape IMPC_CSD_018_001	1	simpleParameter	As expected		TEXT
			One forelimb only - not as expected		
			Both forelimbs - not as expected		
Forelimbs - size IMPC_CSD_019_001	1	simpleParameter	Both forelimbs decreased		TEXT
			One forelimb decreased		
			As expected		
			One forelimb increased		
			Both forelimbs increased		
Forepaw - size IMPC_CSD_040_002	2	simpleParameter	Both forepaws decreased		TEXT
			One forepaw decreased		
			As expected		
			One forepaw increased		
			Both forepaws increased		
Forepaw - shape IMPC_CSD_042_002	2	simpleParameter	As expected		TEXT
			One forepaw not as expected		
			Both forepaws not as expected		
Forelimb nail - number IMPC_CSD_050_002	2	simpleParameter	Both forelimbs decreased number		TEXT
			One forelimb decreased number		
			As expected		
			One forelimb increased number		
			Both forelimbs increased number		
Forelimb nail - length IMPC_CSD_052_002	2	simpleParameter	Both forelimbs decreased length		TEXT
			One forelimb decreased		

			length		
			As expected		
			One forelimb increased length		
			Both forelimbs increased length		
Forelimb nail - shape IMPC_CSD_054_002	2	simpleParameter	As expected		TEXT
			One forelimb not as expected		
			Both forelimbs not as expected		
Forelimb digit - number IMPC_CSD_044_002	2	simpleParameter	Both forelimbs decreased number		TEXT
			One forelimb decreased number		
			As expected		
			One forelimb increased number		
			Both forelimbs increased number		
Forelimb digit - size IMPC_CSD_046_001	1.1	simpleParameter	As expected		TEXT
			One forelimb - increased size		
			One forelimb - decreased size		
			One forelimb - fused		
			Both forelimbs - increased size		
			Both forelimbs - decreased size		
			Both forelimbs - fused		
Forelimb digit - shape IMPC_CSD_048_002	2	simpleParameter	As expected		TEXT
			One forelimb not as expected		
Hindlimbs - position IMPC_CSD_020_001	1.1	simpleParameter	As expected		TEXT
			One Hindlimb only not as expected		
			Both Hindlimbs - not as expected		

Hindlimbs - shape IMPC_CSD_021_001	1.1	simpleParameter	As expected		TEXT
			One Hindlimb only - not as expected		
			Both Hindlimbs - not as expected		
Hindlimbs - size IMPC_CSD_022_001	1.1	simpleParameter	Both Hindlimbs decreased		TEXT
			One Hindlimb decreased		
			As expected		
			One Hindlimb increased		
			Both Hindlimbs increased		
Hindpaw - size IMPC_CSD_041_002	2	simpleParameter	Both Hindpaws decreased		TEXT
			One Hindpaw decreased		
			As expected		
			One Hindpaw increased		
			Both Hindpaws increased		
Hindpaw - shape IMPC_CSD_043_002	2	simpleParameter	As expected		TEXT
			One forepaw not as expected		
			Both forepaws not as expected		
Hindlimb nail - number IMPC_CSD_051_002	2	simpleParameter	Both Hindlimbs decreased number		TEXT
			One Hindlimb decreased number		
			As expected		
			One Hindlimb increased number		
			Both Hindlimbs increased number		
Hindlimb nail - length IMPC_CSD_053_002	2	simpleParameter	Both Hindlimbs decreased length		TEXT
			One Hindlimb decreased length		
			As expected		
			One Hindlimb increased		

			length		
			Both Hindlimbs increased length		
Hindlimb nail - shape IMPC_CSD_055_002	2	simpleParameter	As expected		TEXT
			One Hindlimb not as expected		
			Both Hindlimbs not as expected		
Hindlimb digit - number IMPC_CSD_045_002	2	simpleParameter	Both Hindlimbs decreased number		TEXT
			One Hindlimb decreased number		
			As expected		
			One Hindlimb increased number		
			Both Hindlimbs increased number		
Hindlimb digit - size IMPC_CSD_047_001	1.2	simpleParameter	As expected		TEXT
			One Hindlimb - increased size		
			One Hindlimb - decreased size		
			One Hindlimb - fused		
			Both Hindlimbs - increased size		
			Both Hindlimbs - decreased size		
			Both Hindlimbs - fused		
Hindlimb digit - shape IMPC_CSD_049_002	2	simpleParameter	As expected		TEXT
			One Hindlimb not as expected		
			Both forelimbs not as expected		
Contact righting IMPC_CSD_077_001	1	simpleParameter	Does not try		TEXT
			Tries		
Coat - color - back JMC_CSD_006_001	1	simpleParameter	As expected		TEXT
			White		
			Chinchilla		
			Agouti		

			Grey		
			Other		
Coat - color pattern - back JMC_CSD_009_001	1	simpleParameter	As expected		TEXT
			Patch of different colour		
			Mottled		
			Speckled		
Coat - hair distribution - back JMC_CSD_012_001	1	simpleParameter	As expected		TEXT
			Bald		
			Patches of baldness		
			Thinning		
Coat - hair texture / appearance - back JMC_CSD_015_001	1	simpleParameter	As expected		TEXT
			Not as expected		
Coat - color - abdomen JMC_CSD_005_001	1	simpleParameter	As expected		TEXT
			White		
			Chinchilla		
			Agouti		
			Grey		
			Other		
Coat - color pattern - abdomen JMC_CSD_008_001	1	simpleParameter	As expected		TEXT
			Belly spot		
			Patch of different colour		
			Mottled		
Coat - hair distribution - abdomen JMC_CSD_011_001	1	simpleParameter	Speckled		TEXT
			As expected		
			Bald		
			Patches of baldness		
Coat - hair texture / appearance - abdomen JMC_CSD_014_001	1	simpleParameter	Thinning		TEXT
			As expected		
Coat - color - head JMC_CSD_007_001	1	simpleParameter	Not as expected		TEXT
			As expected		
			White		
			Chinchilla		
			Agouti		
			Grey		
			Other		

Coat - color pattern - head JMC_CSD_010_001	1	simpleParameter	As expected		TEXT
			Belly spot		
			Patch of different colour		
			Mottled		
			Speckled		
Coat - hair distribution - head JMC_CSD_013_001	1	simpleParameter	As expected		TEXT
			Bald		
			Patches of baldness		
			Thinning		
Coat - hair texture / appearance - head JMC_CSD_016_001	1	simpleParameter	As expected		TEXT
			Not as expected		
Skin color - back paws JMC_CSD_023_001	1	simpleParameter	As expected		TEXT
			Red		
			Pale		
			Cyanosed		
Skin color - ear JMC_CSD_024_001	1	simpleParameter	As expected		TEXT
			Red		
			Pale		
			Cyanosed		
Skin color - front paws JMC_CSD_025_001	1	simpleParameter	As expected		TEXT
			Red		
			Pale		
			Cyanosed		
Skin color - snout JMC_CSD_026_001	1	simpleParameter	As expected		TEXT
			Red		
			Pale		
			Cyanosed		
Skin color - tail JMC_CSD_027_001	1	simpleParameter	As expected		TEXT
			Red		
			Pale		
			Cyanosed		
Skin color - whole body JMC_CSD_028_001	1	simpleParameter	As expected		TEXT
			Red		
			Pale		
			Cyanosed		
Skin texture - back paws	1	simpleParameter	As expected		TEXT

JMC_CSD_029_001			Dry		
			Flaky		
			Greasy		
Skin texture - ear JMC_CSD_030_001	1	simpleParameter	As expected		TEXT
			Dry		
			Flaky		
			Greasy		
Skin texture - front paws JMC_CSD_031_001	1	simpleParameter	As expected		TEXT
			Dry		
			Flaky		
			Greasy		
Skin texture - snout JMC_CSD_032_001	1	simpleParameter	As expected		TEXT
			Dry		
			Flaky		
			Greasy		
Skin texture - tail JMC_CSD_033_001	1	simpleParameter	As expected		TEXT
			Dry		
			Flaky		
			Greasy		
Skin texture - whole body JMC_CSD_034_001	1	simpleParameter	As expected		TEXT
			Dry		
			Flaky		
			Greasy		
Vocalization IMPC_CSD_078_001	1	simpleParameter	As expected		TEXT
			Not as expected		
Aggression IMPC_CSD_079_001	1	simpleParameter	As expected		TEXT
			Excessive aggression		
Head bobbing IMPC_CSD_080_001	1	simpleParameter	Absent		TEXT
			Present		
Unexpected behaviors IMPC_CSD_037_001	1	simpleParameter	None		TEXT
			Circling		
			Jumping		
			Retropulsion		
			Other unexpected behavior		
Body weight JMC_CSD_004_001	1	simpleParameter	Integer		INT

Body mass index JMC_CSD_002_001	1	simpleParameter	Integer		INT
Tail ratio JMC_CSD_038_001		simpleParameter	Integer		INT
Comments (in English) IMPC_CSD_087_001	1.1	simpleParameter			TEXT

Metadata

Parameter	Version	Type	Option	Unit	Data Type
Experimenter ID IMPC_CSD_081_001	1.0	procedureMetadata			TEXT
Location of test IMPC_CSD_082_001	1.1	procedureMetadata	Open benchLAF cabinet		TEXT
Number of animals in cage IMPC_CSD_083_001	1.2	procedureMetadata			INT
Number of days since cage changed IMPC_CSD_084_001	1.1	procedureMetadata			INT
Size of squares in arena IMPC_CSD_086_001	1.0	procedureMetadata		cm ²	TEXT