Body Composition (DEXA lean/fat) IMPC_DXA_001

Purpose

Measure bone mineral content and density as well as body composition in mice using the DEXA (Dual Energy X-ray Absorptiometry) analyser.

Experimental Design

- Minimum number of animals: 7 + 7
- Age at test: adult
- Sex: males and females

Procedure

3.1 Weigh the mouse and record the value.

3.2 Calculate and record the volume of anaesthetic solution required for intraperitoneal (IP) injection.

3.3 Anesthetize the mice.

3.4 Monitor the animal carefully until unconsciousness by ensuring that the mouse is adequately sedated.

3.5 Measure the length of the mouse as follows and record the value (accuracy ±0.1cm)

3.5.1 Place the unconscious mouse on a disinfected ruler so that its nose is at zero
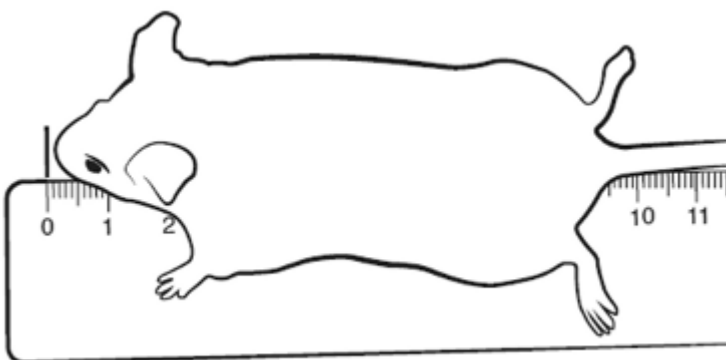
(figure 1).

Figure 1

3.5.2 To measure the entire length of the head press gently against the ruler

(figure 2) and gently pull the tail to ensure that the spine returns to its full
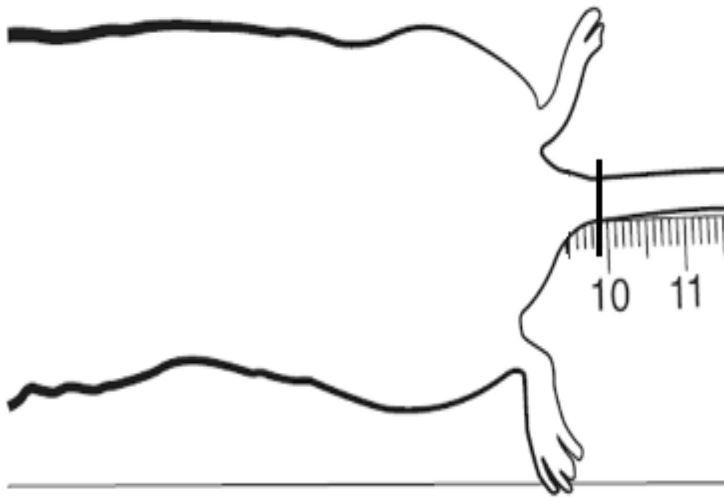
length (figure 3).

Figure 2

Figure 3

3.5.3 Measure the length starting from the nose (0cm) to the beginning of the tail

(figure 4). Record the measurement – the accuracy is within 0.1cm. For

example in figure 4 the length of the mouse is 9.9cm.

Figure 4

3.5.4 Disinfect the ruler and contact area after the measurement has been taken.

3.6 Place the unconscious mouse into the DEXA analyser.

3.7 Follow the manual for the PIXImus2 analyzer to make the measurements.

3.8 For the analysis of the data, regions of interest must be defined. The standard analysis comprises of a whole body analysis excluding the head area.

Continue with X-ray analysis or

3.9 Monitor closely until consciousness is regained.

The count data is transformed by software into bone and non-bone components, thus generating the bone density values. Information is generated about body weight, body length, fat and bone mass, bone mass density, and lean mass of each mouse.

Data QC

Calibration of the system is done in daily intervals using the phantoms delivered by the manufacturer. The results from the calibration runs are recorded by the system.

Parameters

	Version	Type	Increment	Option	Derived	Unit	Data Type
Body weight IMPC_DXA_001_001	1.1	simpleParameter				g	FLOAT
Fat mass IMPC_DXA_002_001	1.1	simpleParameter				g	FLOAT
Lean mass IMPC_DXA_003_001	1.1	simpleParameter				g	FLOAT

	Version	Type	Increment	Option	Derived	Unit	Data Type
Bone Mineral Density (excluding skull) IMPC_DXA_004_001	1.1	simpleParameter				g/cm^2	FLOAT
Bone Mineral Content (excluding skull) IMPC_DXA_005_001	1.1	simpleParameter				g	FLOAT
Body length IMPC_DXA_006_001	1.2	simpleParameter				cm	FLOAT
BMC/Body weight IMPC_DXA_007_001	1.2	simpleParameter			IMPC_DXA_005_001 IMPC_DXA_001_001 /	g	FLOAT
Lean/Body weight IMPC_DXA_008_001	1.2	simpleParameter			IMPC_DXA_003_001 IMPC_DXA_001_001 /	g	FLOAT
Fat/Body weight IMPC_DXA_009_001	1.2	simpleParameter			IMPC_DXA_002_001 IMPC_DXA_001_001 /	g	FLOAT
Bone Area (BMC/BMD) IMPC_DXA_010_001	1.2	simpleParameter			IMPC_DXA_005_001 IMPC_DXA_004_001 /	cm^2	FLOAT
Body_fat_percentage		simpleParameter				%	FLOAT

Metadata

	Version	Type	Increment	Option	Derived	Unit	Data Type
Equipment ID IMPC_DXA_011_001	1.0	procedureMetadata					TEXT
Equipment manufacturer IMPC_DXA_012_001	1.1	procedureMetadata		GE Medical Systems			TEXT
Equipment model IMPC_DXA_013_001	1.0	procedureMetadata		Lunar Piximus II			TEXT
Mouse Status IMPC_DXA_014_001	1.0	procedureMetadata		Anesthetized			TEXT
Anesthesia IMPC_DXA_015_001	1.0	procedureMetadata		Pentobarb			TEXT
Experimenter ID	1.0	procedureMeta					TEXT

	Version	Type	Increment	Option	Derived	Unit	Data Type
IMPC_DXA_016_001		data					