Gross Pathology and Tissue Collection HAS _PAT_002

Purpose

To perform a complete necropsy to detect and record abnormal external findings and macroscopic alterations in internal and external organs, record body and heart weights (see IMPC Heart Weight SOP), and collect a standardized list of tissues for fixation with or without further processing (see non-mandatory IMPC Tissue Embedding & Block Banking SOP).

Experimental Design

Minimum number of mutant animals: 2 mutant males + 2 mutant females

Minimum age of animals: 16 weeks

Equipment

- Corkplate or wax board
- pins
- jar containing tap water to rinse tools
- labelled container with fixative
- fine scissors
- bigger scissors
- forceps
- small spatula
- scalpel
- laboratory balance

Procedure

1. Sacrifice the mouse
2. Weigh and record total body weight (if not done separately)
3. Place mouse on its back and pin the mouse onto board with extended extremities (inner side of hands and foot)
4. Wipe or spray the mouse with 70% ethanol to control hair and dander
5. Proceed with a complete necropsy and tissue collection according to Center-specific technical SOP but be sure to collect the IMPC 'Tissue Collection List' (below) and remove the heart and record its weight according to the IMPC Heart Weight SOP. Inidividual Centers may collect any additional tissue according to Centre-specific technical SOPs.
6. Capture any images of abnormal findings and save images in Centre-specific database
7. Place all tissue collected in a labelled jar containing a sufficient volume of fixative (minimum of 10:1 fixative to tissue)

8. Record all abnormal findings in a Center-specific database using the standardized IMPC Gross Pathology ontology:
    1. MA ontology terms for location/topography
    2. MP ontology terms for presence/absence/large/small/abnormal
    3. PATO ontology terms for descriptors (size, shape, colour, consistency, distribution of lesions)

Notes

Banking of the fixed tissue for long-term storage is according to Centre-specific SOPs (including storage fixative). Options for long-term storage of the fixed tissue include:

- Store in labelled jar in wet fixative for future use or requests
- Trim, process, and embed fixed tissue in paraffin blocks (store or discard tissue not trimmed in)
- Trim, process, and embed fixed tissue in paraffin blocks followed by microtomy and staining of sections on glass slides (store or discard tissue not trimmed in)

Data QC

Images of significant gross findings will be captured as static image files (.tiff or .jpg) and made available to the DCC. Images will be not be annotated but linked by metadata to the mouse line.

Parameters and Metadata

Brain HAS_PAT_001_001 | v1.1

ontologyParameter

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

Description: brain

Eye with optic nerve HAS_PAT_002_001 | v1.1

simpleParameter

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

Description: eye_with_optic_nerve

Options: normal, abnormal eye morphology [MP:0002092], anophthalmia [MP:0001293], phthisis bulbi [MP:0006249], macrophthalmia [MP:0001296], microphthalmia [MP:0001297],

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Spinal cord HAS_PAT_003_001 | v1.1

simpleParameter

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

Description: spinal_cord

Options: normal, abnormal spinal cord morphology [MP:0000955],

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Thymus HAS_PAT_004_001 | v1.1

simpleParameter

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

Description: thymus

Options: normal, abnormal thymus morphology [MP:0000703], enlarged thymus [MP:0000709], small thymus [MP:0000706], athymia [MP:0000705], ectopic thymus [MP:0003007],

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Thyroid HAS_PAT_005_001 | v1.1

simpleParameter

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

Description: thyroid

Options: normal, abnormal thyroid glands [MP:0000681],

Heart HAS_PAT_006_001 | v1.1

simpleParameter

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

Description: heart

Options: normal, abnormal heart morphology [MP:0000266],
dilated heart atrium [MP:0003140], enlarged heart atrium [MP:0008725],
cor triatriatum [MP:0010409], abnormal heart position or orientation [MP:0006065],
dextrocardia [MP:0000644], mesocardia [MP:0000650], atrial situs inversus [MP:0010431],
abnormal heart shape [MP:0000277], enlarged heart [MP:0000274],
small heart [MP:0002188],

Trachea HAS_PAT_007_001 | v1.1

simpleParameter

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

Description: trachea

Options: normal, abnormal trachea morphology [MP:0002282], short trachea [MP:0004550], small trachea [MP:0004549], tracheoesophageal fistula [MP:0003321],

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Esophagus HAS_PAT_008_001 | v1.1

simpleParameter

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

Description: esophagus

Options: normal, abnormal esophagus morphology [MP:0000467], dilated esophagus [MP:0004548], enlarged esophagus [MP:0004545], esophageal atresia [MP:0003276],

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Lung HAS_PAT_009_001 | v1.1

simpleParameter

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

Description: lung

Options: normal, abnormal lung morphology [MP:0001175], enlarged lung [MP:0004882], small lung [MP:0003641], right pulmonary isomerism [MP:0000531], left pulmonary isomerism [MP:0003178], lung cysts [MP:0004880], pulmonary fibrosis [MP:0006050],

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Liver HAS_PAT_010_001 | v1.1

simpleParameter

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

Description: liver

Options: normal, abnormal liver morphology [MP:0000598], liver fibrosis [MP:0003333], enlarged liver [MP:0000599], small liver [MP:0000601], liver abscess [MP:0003332], liver cirrhosis [MP:0003046],

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Gall bladder HAS_PAT_011_001 | v1.1

simpleParameter

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

Description: gall_bladder

Options: normal, abnormal gallbladder morphology [MP:0005084], absent gallbladder [MP:0003250], dilated gallbladder [MP:0009343], enlarged gallbladder [MP:0009342], small gallbladder [MP:0005675],

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Stomach HAS_PAT_012_001 | v1.1

simpleParameter

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

Description: stomach

Options: normal, abnormal stomach morphology [MP:0000470], distended stomach [MP:0009511], enlarged stomach [MP:0003883], gastric polyps [MP:0003299], gastric ulcer [MP:0003282], gastrocolic fistula [MP:0003323],

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Small intestine HAS_PAT_013_001 | v1.1

simpleParameter

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

Description: small_intestine

Options: normal, abnormal duodenum morphology [MP:0003271], intussusception [MP:0003294], duodenal atresia [MP:0003272], duodenal lesions [MP:0002580], duodenum polyps [MP:0008012], abnormal jejunum morphology [MP:0004002], absent jejunum [MP:0000498], abnormal ileum morphology [MP:0002581], distended ileum [MP:0009485], enlarged ileum [MP:0009483],

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Large intestine HAS_PAT_014_001 | v1.1

simpleParameter

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

Description: large_intestine

Options: normal, abnormal large intestine morphology [MP:0000489], intussusception [MP:0003294], abnormal cecum morphology [MP:0000494], absent cecum [MP:0009000], cecal atresia [MP:0009510], cecum polyps [MP:0008013], coiled cecum [MP:0009478], distended cecum [MP:0009480], enlarged cecum [MP:0009476],

small cecum [MP:0009477], abnormal colon morphology [MP:0000495],
colon polyps [MP:0003269], colonic necrosis [MP:0001652], gastrocolic fistula [MP:0003323],
megacolon [MP:0002731], microcolon [MP:0003296],
abnormal rectum morphology [MP:0000492], rectal prolapse [MP:0000493],
perirectal abscess [MP:0003302], rectoperineal fistula [MP:0003318],
rectourethral fusion [MP:0009487], rectovaginal fistula [MP:0003320],
rectovaginal fusion [MP:0009486], proctitis [MP:0003305],

Pancreas HAS_PAT_015_001 | v1.1

simpleParameter

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

Description: pancreas

Options: normal, abnormal pancreas morphology [MP:0001944],
enlarged pancreas [MP:0003450], annular pancreas [MP:0006261],
pancreas cysts [MP:0003336], pancreas fibrosis [MP:0003334],

Spleen HAS_PAT_016_001 | v1.1

simpleParameter

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

Description: spleen

Options: normal, abnormal spleen morphology [MP:0000689], absent spleen [MP:0000690],
enlarged spleen [MP:0000691], small spleen [MP:0000692], accessory spleen [MP:0003342],
pale spleen [MP:0009246],

Kidney HAS_PAT_017_001 | v1.2

simpleParameter

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

Description: kidney

Options: normal, abnormal kidney morphology [MP:0002135],
enlarged kidney [MP:0003068], small kidney [MP:0002989], polycystic kidney [MP:0008528],
absent kidney [MP:0000520], single kidney [MP:0003604], pale kidney [MP:0004969],
fused kidneys [MP:0003605], bifid kidney [MP:0003601],

Adrenal gland HAS_PAT_018_001 | v1.1

simpleParameter

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

Description: adrenal_gland

Options: normal, abnormal adrenal gland morphology [MP:0000639],
absent adrenal gland [MP:0005313], enlarged adrenal glands [MP:0000642],
small adrenal glands [MP:0002768],

Mammary gland HAS_PAT_019_001 | v1.0

simpleParameter

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

Description: mammary_gland

Options: normal, abnormal mammary gland morphology [MP:0000627], absent mammary gland [MP:0000629], supernumerary mammary glands [MP:0009721], ectopic mammary gland [MP:0009741],

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Lymph node HAS_PAT_020_001 | v1.1

simpleParameter

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

Description: lymph_node

Options: normal, abnormal lymph node morphology [MP:0002339], enlarged lymph nodes [MP:0000702], small lymph nodes [MP:0002217], absent lymph nodes [MP:0008024], decreased lymph node number [MP:0002219], increased lymph node number [MP:0002218],

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Skin HAS_PAT_021_001 | v1.1

simpleParameter

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

Description: skin

Options: normal, abnormal skin morphology [MP:0002060], decreased skin turgor [MP:0003653], epidermal cyst [MP:0003414], psoriasis [MP:0001193], skin edema [MP:0001786],

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Skeletal muscle HAS_PAT_022_001 | v1.1

simpleParameter

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

Description: skeletal_muscle

Options: normal, abnormal skeletal muscle morphology [MP:0000759], skeletal muscle degeneration [MP:0009415], decreased skeletal muscle size [MP:0010240], increased skeletal muscle size [MP:0003398],

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Urinary bladder HAS_PAT_023_001 | v1.1

simpleParameter

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

Description: urinary_bladder

Options: normal, abnormal urinary bladder morphology [MP:0000538], urinary bladder prolapse [MP:0003614], urinary bladder obstruction [MP:0009552], urinary bladder diverticulum [MP:0003615], distended urinary bladder [MP:0000539], absent urinary bladder [MP:0009252],

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Testes HAS_PAT_024_001 | v1.0

simpleParameter

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

Description: testes

Options: normal, abnormal testis morphology [MP:0001146], enlarged testes [MP:0001148], small testis [MP:0001147], absent testes [MP:0006415], cryptorchism [MP:0002286], hydrocele [MP:0003623],

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Epididymis HAS_PAT_025_001 | v1.0

simpleParameter

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

Description: epididymis

Options: normal, abnormal epididymis morphology [MP:0002631],

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Prostate HAS_PAT_026_001 | v1.0

simpleParameter

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

Description: prostate

Options: normal, absence of prostate gland [MP:0001159],

Seminal vesicles HAS_PAT_027_001 | v1.0

simpleParameter

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

Description: seminal_vesicles

Options: normal, abnormal seminal vesicle morphology [MP:0002059], herniated seminal vesicle [MP:0003435], enlarged seminal vesicle [MP:0002997], small seminal vesicle [MP:0001157],

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Ovary HAS_PAT_028_001 | v1.0

simpleParameter

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

Description: ovary

Options: normal, abnormal ovary morphology [MP:0001126], enlarged ovary [MP:0004832], small ovary [MP:0001127], ovary cysts [MP:0002016], absent ovary [MP:0003578],

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Uterus HAS_PAT_029_001 | v1.0

simpleParameter

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

Description: uterus

Options: normal, abnormal uterine horn morphology [MP:0009085], dilated uterine horn [MP:0009087], blind uterus [MP:0009084], dilated uterus [MP:0001123], hydrometra [MP:0009709], thin uterus [MP:0009081], uterus atresia [MP:0003568], uterus cysts [MP:0009082], uterus prolapse [MP:0005577], uterus rupture [MP:0003571],

Body Weight HAS_PAT_030_001 | v1.0

simpleParameter

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

Unit Measured: g

Description: body_weight

Experimenter ID HAS_PAT_031_001 | v1.2

procedureMetadata

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

Description: experimenter

Method of sacrifice HAS_PAT_032_001 | v1.0

procedureMetadata

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

Description: sacrifice

Method of Blood Collection HAS_PAT_033_001 | v1.0

procedureMetadata

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

Description: blood_collection

Equipment ID HAS_PAT_034_001 | v1.0

procedureMetadata

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

Description: equipment_name

Images HAS_PAT_035_001 | v1.0

seriesMediaParameter

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

Description: images

Increments: Minimum 1

Fixative HAS_PAT_036_001 | v1.0

procedureMetadata

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

Description: fixative

Equipment manufacturer HAS_PAT_038_001 | v1.0

procedureMetadata

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

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Equipment model HAS_PAT_039_001 | v1.0

procedureMetadata

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

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Date of sacrifice HAS_PAT_040_001 | v1.0

procedureMetadata

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

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ID for cassette processing SOP HAS_PAT_041_001 | v1.0

procedureMetadata

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

Description: ID for center-specific cassette processing protocol

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Date of measurement HAS_PAT_037_001 | v1.0

simpleParameter

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

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Reason for sacrifice HAS_PAT_042_001 | v1.1

procedureMetadata

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

Options: culled sick, Terminal time point, culled control, Unknown, Found dead,

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Procedural comments HAS_PAT_043_001 | v1.0

simpleParameter

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

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