

School of Engineering

DIVISION / UNIT:

Trace metals in medicine

Date: 15-Jan-2019

PRINCIPAL INVESTIGATOR: Jake Brooks (1691763)

OR SUPERVISOR/MANAGER:

Dr Joanna Collingwood

TITLE OF PROCEDURE OR ACTIVITY:

Fontana-Masson staining for neuromelanin

Location of activity

F012B

Laboratory work:

1. SUMMARISE THE ACTIVITY

i) Overview of work: *(Provide a brief summary and include aims and objectives in simple terms.)*

Staining of resin-embedded human brain tissue sections to reveal distribution of neuromela

ii) Description of procedures: (Describe the types of laboratory procedures to be used and highlight any non-standard laboratory operations.)

1. Make up 1 mL of 10% silver nitrate in distilled water.
2. Add concentrated ammonium hydroxide to the solution dropwise until the precipitate
3. Add a further 1 mL of distilled water and filter the working solution. The solution will l

iii) Substances used:

Silver nitrate
Distilled water
Ammonia (35% solution)
Ethanol
Sodium thiosulphate

iv) Quantities used and frequency of use: (This information is vital if potential exposure and hence potential risk are to be accurately assessed under the conditions of use in the particular application.)

100 mg of silver nitrate to make up 1 mL of stock solution. Stock solution to be used every f

2. IDENTIFY THE HAZARDS AND ASSESS THE RISKS TO HEALTH AND SAFETY

Identify hazards:

Silver Nitrate
Hazard statement(s): H272 May intensify fire; oxidizer. H290 May be corrosive to metals.

i) Identify potential route(s) of entry into the body:

Inhalation	Ingestion	Splash in eyes or mouth
Yes / No Yes	Yes / No Yes	Yes / No Yes

ii) Identify any particular groups of workers who may be at increased risk: (for example pregnant workers, young persons under 18, disabled workers, those with pre-existing disease that increases susceptibility.)

None

Anyone who might have compromised resistance to disease for any reason should seek advice from the University Occupational Health Adviser regarding the need for additional precautions.

iii) Could a less hazardous substance (or form of the substance) be used instead? (If it can, then it should be used or justification be given here why it is not being used. COSHH requires substitution with less hazardous materials wherever possible, but there may be good reasons for not using them.)

No, this is a well-established protocol for staining of neuromelanin.

3. DECIDE WHAT PRECAUTIONS ARE NECESSARY TO PREVENT OR CONTROL THE RISKS

Specify what measures are required to control the risk: (Risks must be adequately controlled to prevent exposure or to minimise it to such an extent that any harm is unlikely to result from the exposure. The COSHH Regulations require minimum containment measures for laboratories handling

Consider how your procedure may affect people who are not directly involved in the work (eg cleaners, security staff, service engineers, contractors, visitors, members of the public) and ensure your control measures protect them too.)

Wear nitrile gloves, lab coat and eye protection to avoid contact with skin and eyes. Use of small quantities will minimise risk of inhalation of powder particles. Provide appropriate exhaust ventilation at places where dust is formed.

i) Engineering control measures: (Specify whether required.)

Recently serviced fume hood equipped with filter for powder handling

ii) Personal protective equipment (PPE): *(Specify what is needed. Lab coats will always be required; other protective clothing, eg coveralls or aprons, may be needed but this is unlikely as other measures should be taken to prevent splashing etc. Gloves may be required. If eye protection is needed, indicate whether safety spectacles, goggles or face shields are appropriate, again this is unlikely as other measures should be taken to prevent splashing etc..)*

Lab coat	Gloves	Eye or face (specify if yes)	Other (specify)
Yes / No Yes	Yes / No Yes	Yes / No Yes, safety g	

iii) Other measures:

a) Containment level *(Specify the containment level required and any other control measures. Refer to the local code of practice, local policies or laboratory rules that set out the detailed control measures for work in the laboratory/facility and the local disinfection policy. However check and confirm that the local rules and policies are in place, you are familiar with them.)*

Work will be carried out in fume hood

b) Additional control measures *(Specify any additional control measures that may be needed for specific risks identified above and not covered in the general measures. Consider whether other controls on the work are needed such as restricting the quantity of substance which may be used, prohibiting lone working or specifying the level of supervision required.)*

Quantities will be minimised to mg and mL scale

iv) Waste disposal procedures: *(Consider how any waste will be disposed of before the work is started as some wastes may be difficult to dispose of. Refer to the School waste disposal policy. If further advice is needed, then consult the School Safety Officer.)*

Excess/spillage should be soaked up with absorbent material and waste must be disposed of

v) Emergency procedures: *(In case of accident or spillage, general good practice principles apply with most substances and the procedures are detailed in the local laboratory rules and the School waste disposal policies. Complete this section **only** if a hazard has been identified which requires other, special procedures in an emergency)*

Silver nitrate:

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P370 + P378 In case of fire: Use dry powder or dry sand to extinguish.

4. ENSURE CONTROL MEASURES ARE USED AND MAINTAINED

Specify what, if any, checks on control measures are required and state the frequency of inspection needed: *(It should be ensured that control measures work and continue to work properly. Simple visual inspections may suffice or in some cases more detailed examinations, especially of engineering control measures, may be required.)*

Ensure fan on fume hood is working prior to use.	▲
All personnels conducting Fontana-Masson staining are responsible for familiarising themse	▼
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5. MONITOR EXPOSURE OF WORKERS (IF NECESSARY)

Specify if environmental or personal monitoring is required: *(This is very rarely required for Engineering work: before recommending it, check that it is feasible and decide who is competent to do it. Take advice from the Health and Safety Officer if in doubt.)*

Not required

Specify if health surveillance is required: *(Indicate if workers must register with the Occupational Health Unit, take advice from the Unit if in doubt.)*

Not required

6. PROVIDE INFORMATION, INSTRUCTION AND TRAINING TO PERSONS AT WORK

Specify training requirements: *(Decide whether any special training is required to carry out the procedure safely.)*

Laboratory good practice and online chemical Moodle course.

7. SIGNATURES

The name and signature of the person making the assessment is required. In the case of a student (undergraduate or postgraduate) the supervisor must also sign. The assessment should be reviewed by the manager/supervisor who has been nominated as responsible for the area where the work is carried out.

Name of Assessor:

Jake Brooks

Signature: _____ Date:

16/01/2019

Name of Reviewer:

Dr Joanna Collingwood

Signature: _____ Date:

16/01/2019

APPENDICES

RECORD OF PERSONNEL INVOLVED Ref:

Name	Position and Qualifications	Experience	Start date	Finish date
Jake Brooks James Everett Frederik Lermyt	PhD Student Postdoctoral Research Fellow	Some experience with 7 years relevant lab 7 years relevant lab	January 20 January 20 January 20	October 20 October 20 October 20

Reviewed 11/05/2021:

- Frederik Lermyte is now an Honorary Fellow and not an active user of the lab. James Everett continues as an Honorary Fellow and is an occasional user of the lab.
- Jake Brooks is now a PDRA and the main user of this protocol.
- Newer members of the laboratory will need to become familiar with the content so that they can be formally added to this approval by Prof. Collingwood before performing the procedure.



11th May 2021