

STANDARD OPERATING PROCEDURE

Procedure:	Working with Iodine-125 radioactive isotope in commercial RIA kit
School/Department:	School of Molecular Bioscience
SOP prepared by:	Fiona Atkinson and Nick Coleman
Version:	SMB045.3

Section 1 - Personal Protective Equipment

1. Lab coat or lab gown
2. Latex or Nitrile gloves
3. Enclosed footwear
4. Lead-impregnated Perspex shield – 1 cm thick
5. Geiger counter

Section 2 – Potential Hazards + Safety precautions

1. ^{125}I isotope emits gamma radiation. This radiation is very penetrating, although the overall activities used in the kit are low. It is particularly important to minimise the risk of inhalation or skin absorption.
2. Chronic exposure may lead to accumulation of radioiodine in the thyroid gland.
3. Chronic exposure to radiation may result in mutagenic effects (DNA damage, cancer, birth defects).
4. Do not work with radioisotopes if you are pregnant or trying to get pregnant – the developing baby is more susceptible to DNA damage than an adult, and you may be pregnant with the most sensitive early stage embryo before you know for sure.
5. Glass or plastic provides adequate shielding, if the barrier is properly deployed (between your body and the radiation source).
6. Contamination on the skin could lead to the absorption of ^{125}I into the body. Other routes of exposure include inhalation and ingestion, so never eat or drink while working with radioisotopes, and always wash your hands afterwards. If isotopes are swallowed or inhaled, seek medical advice.
7. The chemicals labelled with the ^{125}I isotope may also pose their own toxicity separate from the radiation risk. Check the SDS for details.
8. Long hair must be tied back.
9. Workers with pre-existing medical conditions (e.g. allergy, immunocompromised state, chemical sensitivity) and workers who are pregnant or expecting pregnancy must consult with their supervisor AND medical specialist AND the university's WHS services before performing this procedure. If there are any serious concerns expressed by any of these individuals, this task must not be performed.

Section 3 – Procedure

1. Know the location of spill kit, eye wash station and safety shower before starting.
2. Read and understand the Risk Assessment for Working with Radioisotopes. If anything is unclear or if you are unsure of the risks, consult your supervisor before starting any hands-on work.
3. Worker must wear appropriate PPE (gloves, lab coat).
4. Worker must ensure that the lead-impregnated Perspex shield is placed between their body and the radioactive material at all times when work is in progress
5. All pipetting of liquid ^{125}I -labelled insulin must occur in the designated area, i.e. within the Perspex spill tray.
6. When decanting samples, minimise time the radioactive waste bottle is open.
7. Gloves should be changed and disposed of into designated radioactive waste bins. Change gloves frequently.
8. Upon completion of experiments, all used bench coat, paper towels, gloves should be disposed of into designated radioactive waste bin.
9. Wash hands thoroughly before leaving.

Section 4 – Disposal / Spills / Incidents

1. All radioactive waste must be disposed of into designated waste containers.
2. Add Viraclean (to 1/10 dilution) or freshly prepared bleach (to 1%) in the liquid waste bottle to neutralise the biological hazard (human plasma).
3. All radioactive waste bags and bottles need to be labelled with lab name, date of disposal, and amount of radioactivity it contains (e.g. ^{125}I radioactive waste + human plasma, activity 10 Bq per gram, total volume 1 litre, Lab 470, October 2013). Consult the school Radiation Safety Officer or the school Waste Disposal Officer if in doubt.
4. All spills must be cleaned up immediately and thoroughly with Decon 90 (see below the Perspex pipetting area for spill kit and Decon90). Absorb wet spill with absorbent paper and soak with Decon 90. Discard absorbent material into radioactive solid waste container, and wipe spill area again with 5% solution of Decon 90 (diluted with water). Discard wipe material again into designated waste container. Wash hands thoroughly after clean-up procedures. Confirm that no radioactivity is detectable in the spill area or on your body after cleanup using Geiger counter.
5. Do not mix different types of radioisotopes in the liquid or solid wastes.
6. All incidents and injuries should be reported to your supervisor, and via an online incident report (Riskware)

Section 5 – Repairs / Certification / Validation

1. Geiger counter must be calibrated annually.

Section 6 – Relevant safety data sheets

Safe handling guide for ^{125}I

Section 7 - References

1. Coat-A-Count Insulin RIA kit product literature
2. Risk assessment for working with ^{125}I

SOP Consultation, Training and Approval

Print names and enter signatures and dates to certify that the persons named in this section have been consulted/trained in relation to the development and implementation of this Standard Operating Procedure. WHS Representative (WHS Committee) certifies that consultation has taken place.

Position	Name	Signature	Date
Supervisor			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			

Creation date: 18/10/2013
Last review date: 30/3/2015

Next review due: 30/3/2017

Page 2 of 3

employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			
employee / student			

Name Authorising (Printed): DIANNE FISHER.....

Signature:  **Date:** 30/3/15

WHS Committee Representative Name (Printed): MARKUS HOFER.....

Signature:  **Date:** 30/3/15