SAFETY DATA SHEET

APOPTOSIS TUNEL ASSAY KIT

This Safety Data Sheet contains information concerning the potential risks to those involved in handling, transporting and working with the material, as well as describing potential risks to the consumer and the environment. This information must be made available to those who may come into contact with the material or are responsible for the use of the material. This Safety Data Sheet is prepared in accordance with formatting described in the REACH Regulation (EC) No 1907/2006, and described in CLP Regulation (EC) No 1272/2008.

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

APOPTOSIS TUNEL ASSAY KIT

Test kit containing the following reagents:

1. 1 x box 4 control slides
2. 1 x 22ml bottle Blocking Buffer
3. 1 x vial 6 H₂O₂/Urea Tablets
4. 1 x 110ul vial Proteinase-K
5. 1 x vial 6 DAB Tablets
6. 1 x 41ul vial TdT Enzyme
7. 1 x 440ul vial Br-dUTP
8. 1 x 35ul vial 200X Conjugate
9. 1 x 1.75ml vial 5X Reaction Buffer
10. 1 x 27.5ul vial Biotin-PRB-1 mAb
11. 1 x 6ml bottle Methyl Green

1.2 Relevant identified uses of the substance or mixture and uses advised against

For Research and Development use only.

1.3 Details of the supplier of the safety data sheet

AbD Serotec – a Bio-Rad Company
Endeavour House
Langford Business Park
Kidlington
Oxford
OX5 1GE
Tel: +44 (0) 1865 852700
E mail: safetydatasheets@abdserotec.com
Web: www.abdserotec.com

1.4 Emergency telephone number

Tel. +44 (0) 1865 852700 (9.00 am – 5.00 pm Mon-Fri)

SECTION 2: Hazards Identification

2.1 Classification of the substance or mixture

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification in Accordance with Dangerous Preparations Directive 1999/45/EC</th>
<th>Classification in accordance with CLP Regulation EC (no) 1272/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Control slides</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>2. Blocking Buffer</td>
<td>Not classified as hazardous</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>3. Urea Peroxide</td>
<td>Ox;C R8 R34</td>
<td>Ox. Sol. 3 H272</td>
</tr>
</tbody>
</table>

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### Tablets

<table>
<thead>
<tr>
<th>Tablets</th>
<th>Skin Corr. 1B H314</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Proteinase-K</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>5. DAB Tablets</td>
<td>Carc. Cat. 2; R45, Muta. Cat. 3; R68, Xi; R36/37/38</td>
</tr>
<tr>
<td></td>
<td>Carc. 1B, H350, Muta. 2, H341, Skin Irrit. 2 H315, Eye Irrit. 2 H319, STOT SE 3 H335</td>
</tr>
<tr>
<td>6. TdT Enzyme</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>7. Br-dUTP</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>8. 200X Conjugate</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>9. 5X Reaction Buffer</td>
<td>T; R23/25 Carc. Cat. 2; R49; Muta. Cat. 3; R68; Repr. Cat. 2; R60; R42/43; N; R50/53</td>
</tr>
<tr>
<td></td>
<td>Acute Tox. 3 H301 Carc. 1B H350i Mut. 2 H341 Resp. Sens. 1 H334 Skin Sens. 1 H317 Aquatic Acute 1 H400 Aquatic Chronic 1 H410</td>
</tr>
<tr>
<td>10. Biotin-PRB-1 mAb</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>11. Methyl Green stain</td>
<td>Not hazardous</td>
</tr>
</tbody>
</table>

### 2.2 Label elements

#### 3. Urea Peroxidase Tablets

**Danger**

H272 May intensify fire; oxidiser
H314 Causes severe skin burns and eye damage
P221 Take any precaution to avoid mixing with combustibles/…
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

#### 5. DAB Tablets

**Danger**

H350 May cause cancer
H341 Suspected of causing genetic defects
H315 Causes skin irritation
H319 Causes serious eye irritation
H335 May cause respiratory irritation
P202 Do not handle until all safety precautions have been read and understood.
P281 Use personal protective equipment as required.
P308 + P313 IF exposed or concerned: Get medical advice/attention.

#### 9 5X Reaction Buffer
### Danger

- **H301** Toxic if swallowed
- **H331** Toxic if inhaled
- **H350i** May cause cancer by inhalation
- **H341** Suspected of causing genetic defects
- **H360F** May damage fertility
- **H334** May cause allergy or asthma symptoms or breathing difficulties if inhaled
- **H317** May cause an allergic skin reaction
- **H410** Very toxic to aquatic life with long lasting effects

**P202** Do not handle until all safety precautions have been read and understood.

**P273** Avoid release to the environment.

**P281** Use personal protective equipment as required.

**P302 + P352** IF ON SKIN: Wash with plenty of soap and water.

**P308 + P313** IF exposed or concerned: Get medical advice/attention.

### 2.3 Other hazards

Other kit components contain material of biological origin.

### SECTION 3: Composition

#### 3.2 Mixtures

**Urea Peroxide Tablets**

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No</th>
<th>Concentration</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea Peroxide</td>
<td>124-43-6</td>
<td>&gt;95%</td>
<td>O; C R8 R34</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ox. Sol. 3 H272</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Skin Corr. 1B H314</td>
</tr>
</tbody>
</table>

**Proteinase K**

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No</th>
<th>Concentration</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proteinase K</td>
<td>39450-01-6</td>
<td>0.2%</td>
<td>Xn R36/37/38 - 42</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Skin Irrit. 2 H315; Eye Irrit. 2 H319; STOT SE 3 H335; Resp.Sens. 1 H334</td>
</tr>
</tbody>
</table>

**DAB Tablets**

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No</th>
<th>Concentration</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triszma Base / Tris hydrochloride</td>
<td></td>
<td>~ 30%</td>
<td>Xi; R36/37/38 (CHIP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Skin Irrit. 2 H315; Eye Irrit. 2 H319; STOT SE 3 H335 (CLP)</td>
</tr>
<tr>
<td>3,3'-Diaminobenzidine</td>
<td>7411-49-6</td>
<td>3%</td>
<td>Carc. Cat. 2; R45</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Muta. Cat. 3; R68 (CHIP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Carc. 1B, H350</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Muta. 2, H341</td>
</tr>
</tbody>
</table>

**5X Reaction Buffer**

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No</th>
<th>Concentration</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cacodylic Acid, Sodium Salt</td>
<td>124-65-2</td>
<td>21%</td>
<td>T; R23/25 N;R50/53</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Acute Tox. 3; H301,</td>
</tr>
</tbody>
</table>
See section 16 for full description of R phrases and H statements.

**SECTION 4: First Aid Measures**

**4.1 Description of first aid measures**

**EYE CONTACT:** Rinse thoroughly with flowing water for at least 15 minutes, whilst gently holding the eyelids open and seek immediate medical attention.

**INHALATION:** If breathing difficulties occur, remove victim to fresh air. If victim experiences continued breathing difficulties, keep patient warm and at rest, and seek medical attention. If breathing stops, begin artificial respiration and seek immediate medical attention.

**SKIN CONTACT:** Wash thoroughly with soap and water. Seek medical attention if redness or irritation occurs. Wash contaminated clothing before re-use.

**INGESTION:** If swallowed, rinse mouth with water. Give 200-300 ml to drink. DO NOT INDUCE VOMITING. Never give anything by mouth to an unconscious person. Seek immediate medical attention.

**4.2 Most important symptoms and effects, both acute and delayed**

**EYE CONTACT:** (Urea peroxide and Proteinase K) Redness, watering, pain, burns

(SX Reaction Buffer, DAB tablets) Slight irritation

**INHALATION:** (SX Reaction buffer) Dizziness, headache, nausea, diarrhoea, cardiocascular disorders, changes in blood count, toxic effects on kidney. May cause allergic reaction in sensitised individuals.

(Urea peroxide, DAB Tablets) Inhalation is not likely to occur

(Proteinase K) May cause allergic reaction in sensitised individuals.

**SKIN CONTACT:** (5X Reaction buffer and Proteinase K) May cause allergic reaction in sensitised individuals.

(Urea peroxide) Redness, irritation, pain, burns. May cause allergic reaction in sensitised individuals.

(DAB Tablets) Not expected to cause any adverse symptoms in contact with skin

**INGESTION:** (5X Reaction buffer) Dizziness, headache, nausea, diarrhoea, cardiocascular disorders, changes in blood count, toxic effects on kidney

(Urea peroxide) Irritation and possibly burns of the mouth and throat.

(DAB Tablets and Proteinase K) May cause mild discomfort and gastrointestinal disturbances.

**4.3 Indication of any immediate medical attention and special treatments needed**

Symptomatic treatment as required

**SECTION 5: Firefighting Measures**

**5.1 Extinguishing media**

Use water spray, foam or dry powder extinguisher to extinguish fires.

**5.2 Special hazards arising from the substance or mixture**

May give off toxic and irritating fumes in a fire, including hydrogen chloride and nitrogen oxides.

**5.3 Advice for fire fighters**

Wear self-contained breathing apparatus and chemical protection suit.

**SECTION 6: Accidental Release Measures**

**6.1 Personal precautions, protective equipment and emergency procedures**
6.2 Environmental precautions
Prevent entry into drains and watercourses. Do not flush to sewers.

6.3 Methods and materials for containment and clearing up
Absorb spilled material onto a suitable absorbent or paper towels and place in a sealed container for disposal. Wash spill area thoroughly with water and detergent. Urea peroxide tablets should be collected and placed in a suitable container for disposal. Do not use paper towels or combustible absorbents on this material.

6.4 References to other sections
See section 8 for further advice on protective equipment and section 13 for advice on disposal.

SECTION 7: Handling and Storage

7.1 Precautions for safe handling
Ensure good ventilation when handling, preferably use in a fume hood or biological safety cabinet with extraction ventilation. Avoid generation of aerosols. Avoid inhalation, skin and eye contact. Change contaminated clothing immediately. Wash thoroughly after handling and before eating and drinking.

7.2 Conditions for safe storage, including any incompatibilities
Keep tightly closed, in original containers. Keep locked up, in a cool, dry, well ventilated place. Store at -20°C before first use.

7.3 Specific end uses(s)
Only for use as a laboratory reagent.

SECTION 8. Exposure Controls/Personal Protection

8.1 Control parameters

<table>
<thead>
<tr>
<th>Substance</th>
<th>8 hour exposure limit</th>
<th>15 minute exposure limit</th>
<th>Source, Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic compounds</td>
<td>0.1 mg/m³</td>
<td></td>
<td>EH40, 2007</td>
</tr>
<tr>
<td>Hydrogen peroxide</td>
<td>1 ppm (1.4 mg/m³)</td>
<td>2 ppm (2.8 mg/m³)</td>
<td>EH40, 2007</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

Respiratory protection
Not normally required

Hand Protection
Wear suitable chemical resistant gloves. Change gloves in accordance with manufacturer recommendations. If gloves are damaged during use, remove immediately and wash hands before replacing with new gloves.

Eye protection
Wear safety glasses with side protection to prevent splashes to the eye.

Skin protection
Wear suitable protective clothing – lab coat or coveralls. These should be changed after use or if contaminated. Wash before re-use.

SECTION 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Urea Peroxide Tablet</th>
<th>Proteinase K</th>
<th>DAB Tablets</th>
<th>5X Reaction Buffer</th>
</tr>
</thead>
</table>
## Appearance:

<table>
<thead>
<tr>
<th>Appearance:</th>
<th>White tablet</th>
<th>Colourless liquid</th>
<th>Brown tablet</th>
<th>Pink liquid</th>
</tr>
</thead>
</table>

## Odour:

| Odour:               | No data      | No data          | No data      | No data     |

## pH:

| pH                   | Not applicable | 8                | Not applicable | 6.5         |

## Melting point:

| Melting point:       | No data       | Approx. 0°C      | No data       | Approx. 0°C |

## Boiling point:

| Boiling point:       | No data       | Approx. 100°C    | No data       | Approx. 100°C |

## Flashpoint:

| Flashpoint:          | Not applicable | Not flammable    | Not applicable | Not flammable |

## Evaporation rate:

| Evaporation rate:    | No data       | Similar to water | No data       | Similar to water |

## Flammability (solids, gases):

| Flammability (solids, gases): | Not flammable | Not applicable | Not flammable | Not applicable |

## Upper/lower flammability limits:

| Upper/lower flammability limits: | Not applicable | None            | Not applicable | None          |

## Vapour pressure:

| Vapour pressure:       | No data       | Similar to water | No data       | Similar to water |

## Vapour density:

| Vapour density:        | No data       | Similar to water | No data       | Similar to water |

## Relative density:

| Relative density       | Not applicable | Approx. 1.0      | Not applicable | Approx. 1.0     |

## Solubility in water:

| Solubility in water:   | Soluble       | Soluble          | Soluble       | Soluble       |

## Solubility in other solvents:

| Solubility in other solvents: | No data       | No data          | No data       | No data       |

## Partition coefficient (log Kow):

| Partition coefficient (log Kow): | No data       | No data          | No data       | No data       |

## Autoignition temperature:

| Autoignition temperature | No data       | Not applicable   | No data       | Not applicable |

## Decomposition temperature:

| Decomposition temperature | No data       | No data          | No data       | No data       |

## Viscosity:

| Viscosity              | No data       | No data          | No data       | No data       |

## Explosive properties:

| Explosive properties   | Not explosive | Not explosive    | Not explosive | Not explosive |

## Oxidising properties:

| Oxidising properties   | Oxidising     | Not oxidising    | Not oxidising | Not oxidising |

### SECTION 10: Stability and Reactivity

#### 10.1 Reactivity

Urea peroxide is oxidising, however, the quantities supplied are very small and unlikely to cause a significant hazard in practice.

#### 10.2 Chemical stability

Stable under normal conditions.

#### 10.3 Possibility of hazardous reactions

Hazardous polymerisation will not occur

#### 10.4 Conditions to avoid

Exposure to heat, strong sunlight.

#### 10.5 Incompatible materials

Strong bases, oxidisers, reducing agents acids. Cacodylic acid reacts with acid to form the highly toxic gas dimethylarsine.

#### 10.6 Hazardous decomposition products

None under normal conditions of use.

### SECTION 11: Toxicological Information

#### 11.1 Information on toxicological effects

This product has not been tested. Judgements on the expected toxicity of this product have been made based upon consideration of its major components.
(a) acute toxicity

5X Reaction Buffer - Ingestion of cacodylic acid is likely to result in nausea, vomiting and diarrhoea, and possibly shock, rapid pulse, coma. Cacodylic acid may cause adverse effects on the bladder and kidney. Inhalation may result in symptoms of respiratory distress and similar effects to ingestion.

Urea peroxide – may cause irritation and burns to the mouth, throat and digestive system if ingested.

Proteinase K – not expected to be acutely toxic

DAB Tablets - not expected to be acutely toxic

(b) skin corrosion/irritation

5X Reaction Buffer is not considered to be irritating or corrosive.

Urea peroxide is classified as corrosive and may cause irritation and burns to the skin.

Proteinase K Buffer is not considered to be irritating or corrosive.

DAB Tablets may be irritating if they come into contact with skin.

(c) serious eye damage/irritation

5X Reaction Buffer is not considered to be irritating to eyes.

Urea peroxide is classified as corrosive and may cause irritation and burns to the skin.

Proteinase K Buffer is not considered to be irritating or corrosive.

DAB Tablets may be irritating to the eyes if they come into contact.

(d) respiratory/skin sensitisation

5X Reaction Buffer contains cobalt chloride, a skin and respiratory sensitisier.

Urea peroxide is not considered to be sensitising

Proteinase K is classified as sensitising, and may cause allergic reaction in sensitive individuals.

DAB Tablets – 3,3’-diaminobenzidine is not known to be sensitising.

(e) germ cell mutagenicity

5X Reaction Buffer contains cobalt chloride which is a suspected mutagen.

Urea peroxide is not considered to be a mutagen.

Proteinase K is not considered to be a mutagen.

DAB Tablets – has shown genotoxic effects in vitro and is classified as a mutagen.

(f) carcinogenicity

5X Reaction Buffer contains cobalt chloride which is classified as carcinogenic.

Urea peroxide is not considered to be a carcinogen.

Proteinase K is not considered to be a carcinogen.

DAB Tablets – 3,3’-Diaminobenzidine is classified as a carcinogen, based on structural analogy with similar compounds.

(g) reproductive toxicity

5X Reaction Buffer contains cobalt chloride which has adverse effects on fertility.

Urea peroxide is not considered to be hazardous to reproduction.

Proteinase K is not considered to be hazardous to reproduction.

DAB Tablets – is not considered to be hazardous to reproduction.

(h) STOT-single exposure

No components have been identified as being classified for STOT effects.

(i) STOT-repeated exposure

No components have been identified as being classified for STOT effects.

(j) aspiration hazard

Contains no substances considered to present an aspiration hazard.

SECTION 12: Ecological Information

This product has not been tested. Judgements on the expected environmental effects of this product have been made based upon consideration of its major components.

12.1 Toxicity

5X Reaction Buffer is classified an acute and chronic toxicant in the environment. However, given the very small quantities supplied (1.75 ml vial), it is expected that there will not be a significant impact from the use of this product.

12.2 Persistence and degradability

No data available. Structural analysis suggests 3,3’-diaminobenzidine may not be degraded rapidly in the environment. Sodium cacodylate and cobalt chloride, components of 5X Reaction Buffer are both considered to pose a long term hazard in the environment. However, given the very small quantities supplied it is expected that there will not be a significant impact from the use of this product.
12.3 Bioaccumulative potential
None of the components are known to bioaccumulate.

12.4 Mobility in soil
All components are soluble.

12.5 Results of PBT and vPvB assessment
A formal PBT/vPvB assessment has not been carried out, but none of the components are expected to be PBT or vPvB.

12.6 Other adverse effects
None known.

SECTION 13: Disposal Considerations

13.1 Waste treatment methods
Dispose of this material as hazardous waste, in accordance with local and national regulations. Used product may contain material that presents a biohazard, and should be disposed of accordingly.

SECTION 14: Transport Information

Urea Peroxide
14.1 UN Number 1511
14.2 UN Proper shipping name Urea Hydrogen peroxide
14.3 Transport hazard class(es) 5.1, 8
14.4 Packing group III
14.5 Environmental hazards None
14.6 Special precautions for user None
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not transported in bulk

5X Reaction Buffer
14.1 UN Number 3280
14.2 UN Proper shipping name Organoarsenic compound liquid, N.O.S.
14.3 Transport hazard class(es) 6.1
14.4 Packing group II
14.5 Environmental hazards Yes, EHS mark required
14.6 Special precautions for user None
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not transported in bulk

SECTION 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
All components are listed as existing substances in Europe.

15.2 Chemical Safety Assessment
A Chemical Safety Assessment has not been carried out for this product.

SECTION 16: Other Information

R Phrases and H Statements used in Section 3

R8 Contact with combustible material may cause fire
R22 Harmful if swallowed
R23/25 Toxic by inhalation and if swallowed
R34 Causes burns
R36/37/38 Irritating to eyes, respiratory system and skin
R42  May cause sensitisation by inhalation
R42/43 May cause sensitisation by inhalation and skin contact
R49  May cause cancer by inhalation
R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R60  May impair fertility
R68  Possible risk of irreversible effects.

H271 May cause fire or explosion; strong oxidiser
H301 Toxic if swallowed
H302 Harmful if swallowed
H314 Causes severe skin burns and eye damage
H317 May cause an allergic skin reaction
H319 Causes serious eye irritation
H331 Toxic if inhaled
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335 May cause respiratory irritation;
H341 Suspected of causing genetic defects
H350 May cause cancer
H350i May cause cancer by inhalation
H360F May damage fertility
H400 Very toxic to aquatic life
H410 Very toxic to aquatic life with long lasting effects

Revision information: This is a new Safety Data Sheet.