SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Methylglyoxal Assay Kit

PRODUCT CODES: Cat# K461-100

MANUFACTURER: BioVision, Inc.
DIVISION: 
ADDRESS: 155 S. Milpitas Boulevard, Milpitas, CA 95035

EMERGENCY PHONE: 858-373-8066
CHEMTREC PHONE: 
OTHER CALLS: 408-493-1800
FAX PHONE: 408-493-1801

SECTION 2: HAZARDS IDENTIFICATION

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Volume</th>
<th>Safety Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG Assay Buffer</td>
<td>-</td>
<td>25 ml</td>
<td>No hazards</td>
</tr>
<tr>
<td>PicoProbeTM (in DMSO)</td>
<td>In DMSO</td>
<td>0.4 ml</td>
<td>See below</td>
</tr>
<tr>
<td>Substrate Mix A</td>
<td>Liquid</td>
<td>1 vial</td>
<td>No hazards</td>
</tr>
<tr>
<td>Substrate Mix B</td>
<td>Liquid</td>
<td>1 vial</td>
<td>No hazards</td>
</tr>
<tr>
<td>Enzyme Mix A</td>
<td>Liquid</td>
<td>22 µl</td>
<td>No hazards</td>
</tr>
<tr>
<td>Enzyme Mix B</td>
<td>Liquid</td>
<td>120 µl</td>
<td>No hazards</td>
</tr>
<tr>
<td>Enzyme Mix C</td>
<td>-</td>
<td>1 vial</td>
<td>No hazards</td>
</tr>
<tr>
<td>Extraction Solution</td>
<td>Contains TCA</td>
<td>2 ml</td>
<td>See below</td>
</tr>
<tr>
<td>MG Standard (20 mM)</td>
<td>Liquid</td>
<td>1.1 ml</td>
<td>No hazards</td>
</tr>
</tbody>
</table>

Trichloroacetic acid:
Emergency Overview
OSHA Hazards: Target organ effect, Corrosive, Carcinogen
Target Organs: Central nervous system
Other hazards which do not result in classification: Vesicant
GHS Classification:
- Acute toxicity, Oral (Category 5)
- Skin corrosion (Category 1A)
- Serious eye damage (Category 1)
- Acute aquatic toxicity (Category 1)
- Chronic aquatic toxicity (Category 1)

GHS Label elements, including precautionary statements

Pictogram:
Signal word: Danger
Hazard statement(s):
- H303 May be harmful if swallowed.
- H314 Causes severe skin burns and eye damage.
- H410 Very toxic to aquatic life with long lasting effects.
Precautionary statement(s):
- P273 Avoid release to the environment.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P310 Immediately call a POISON CENTER or doctor/physician.

HMIS Classification
- Health hazard: 3
- Chronic health hazard: *
- Flammability: 1
- Physical hazards: 0

NFPA Rating
- Health Hazard: 3
- Fire: 1
- Reactivity Hazard: 0

Potential Health Effects
Inhalation: May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Skin: May be harmful if absorbed through skin. Causes skin burns.
Eyes: Causes eye burns. Causes severe eye burns.
Ingestion: May be harmful if swallowed.

DMSO:
Emergency Overview
OSHA Hazards: Combustible liquid, Target organ effect
Target Organs: Eyes, Skin
GHS Classification: Flammable liquids (Category 4)
GHS Label elements, including precautionary statements
Pictogram: none
Signal word: Warning
Hazard statement(s): H227 Combustible liquid
Precautionary statement(s): none
HMIS Classification
Health hazard: 0
Chronic Health Hazard: *
Flammability: 2
Physical hazards: 0
NFPA Rating
Health hazard: 0
Fire: 2
Reactivity Hazard: 0
Potential Health Effects
Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
Skin: May be harmful if absorbed through skin. May cause skin irritation.
Eyes: May cause eye irritation.
Ingestion: May be harmful if swallowed.
Aggravated Medical Condition: Avoid contact w/DMSO solutions containing toxic materials or materials with unknown toxicological properties. DMSO is readily absorbed through skin and may carry such materials into the body.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS Number</th>
<th>EC-No.</th>
<th>Molecular Weight</th>
<th>Chemical Formula</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trichloroacetic acid</td>
<td>76-03-9</td>
<td>200-927-2</td>
<td>163.39</td>
<td>C2HCl3O2</td>
<td>50%</td>
</tr>
<tr>
<td>DMSO</td>
<td>67-68-5</td>
<td>200-684-3</td>
<td>78.13</td>
<td>C2H6OS</td>
<td>100%</td>
</tr>
</tbody>
</table>

SECTION 4: FIRST AID MEASURES

If inhaled: If breathed in, move person into fresh air. If not breathing, give artificial respiration.
In case of skin contact: Wash off with soap and plenty of water.
In case of eye contact: Flush eyes with water as a precaution.
If swallowed: Never give anything by mouth to an unconscious person. Rinse mouth with water.

5: FIRE-FIGHTING MEASURES

DMSO:
Suitable extinguishing media: For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.
Special protective equipment for firefighters: Wear self-contained breathing apparatus for firefighting if necessary.
Hazardous combustion products: Hazardous combustion products formed under fire conditions – no data available.
Further information: Use water spray to cool unopened containers.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions: Avoid dust formation. Avoid breathing vapors, mist, gas, or dust.
Environmental precautions: Do not let product enter drains.
Methods for cleaning up: Sweep up and shovel. Keep in suitable, closed containers for disposal.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling
Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.
Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place.
Recommended storage temperature: -20 °C

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION
Trichloroacetic acid:

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trichloroacetic acid</td>
<td>76-03-9</td>
<td>TWA</td>
<td>1 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td>Remarks:</td>
<td></td>
<td></td>
<td></td>
<td>Eye &amp; upper respiratory tract irritation. Confirmed animal carcinogen with unknown relevance to humans.</td>
</tr>
</tbody>
</table>

TWA | 1 ppm | 7 mg/m³ | USA. OSHA – Table Z.1 Limits for Air Contaminants – 1910.1000 |

TWA | 1 ppm | 7 mg/m³ | USA. NIOSH recommended exposure limits |

DMSO:

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl sulfoxide</td>
<td>67-68-5</td>
<td>TWA</td>
<td>250 ppm</td>
<td>USA. Workplace Environmental Exposure Levels (WEEL)</td>
</tr>
</tbody>
</table>

Personal protective equipment

Respiratory protection
Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove’s outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection
Choose body protection in relation to its type, to the concentration and amount of dangerous substance, and to the specific workplace. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures
General industrial hygiene practice.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Trichloroacetic acid</th>
<th>DMSO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance:</td>
<td>White crystalline powder</td>
<td>Clear liquid</td>
</tr>
<tr>
<td>pH:</td>
<td>1 at 81.7 g/l at 25 °C (77 °F)</td>
<td>No data available</td>
</tr>
<tr>
<td>Water Solubility:</td>
<td>Completely soluble</td>
<td>Completely miscible</td>
</tr>
<tr>
<td>Other Solubility:</td>
<td>No data available</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling Point (°C):</td>
<td>196 °C (385 °F)</td>
<td>189 °C (372 °F)</td>
</tr>
<tr>
<td>Melting Point (°C):</td>
<td>54-58 °C (129-136 °F)</td>
<td>16-19 °C (61-66 °F)</td>
</tr>
<tr>
<td>Flash Point (°C):</td>
<td>&gt;113 °C (&gt;235 °F)</td>
<td>87 °C (189 °F)</td>
</tr>
<tr>
<td>Ignition Temperature (°C):</td>
<td>No data available</td>
<td>301 °C (574 °F)</td>
</tr>
<tr>
<td>Density</td>
<td>1.62 g/cm³ at 25 °C (77 °F)</td>
<td>1.1 g/ml</td>
</tr>
</tbody>
</table>

SECTION 10: STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Trichloroacetic acid</th>
<th>DMSO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical stability:</td>
<td>Stable under recommended storage conditions</td>
<td>Heat, Flames, Sparks</td>
</tr>
<tr>
<td>Conditions to avoid:</td>
<td>Exposure to moisture. Heat.</td>
<td>Acid chlorides, Phosphorus halides, Strong acids, Strong oxidizing agents, Strong reducing agents</td>
</tr>
<tr>
<td>Materials to avoid:</td>
<td>Strong oxidizing agents, strong bases, amines</td>
<td></td>
</tr>
<tr>
<td>Hazardous decomposition products:</td>
<td>No data available</td>
<td>Carbon oxides, sulfur oxides</td>
</tr>
</tbody>
</table>

SECTION 11: TOXICOLOGICAL INFORMATION

Trichloroacetic acid:

Acute toxicity: LD50 Oral – rat – 3,320 mg/kg
Skin corrosion/irritation: no data available
Serious eye damage/eye irritation: Eyes – rabbit – severe eye irritation – 5 s
Respiratory or skin sensitization: no data available
Germ cell mutagenicity: no data available
Carcinogenicity:
IARC: 3 – Group 3: Not classifiable as to its carcinogenicity to humans (Trichloroacetic acid)
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
Other adverse effects:

PBT and vPvB assessment:
- Mobility in soil: no data available
- Bioaccumulative potential: no data available

Toxicity:
- Persistence and degradability:
  - Trichloroacetic acid: no data available

SECTION 12: ECOLOGICAL INFORMATION

Signs and Symptoms

Potential Health Effects
- Specific target organ toxicity – single exposure (GHS): no data available
- Specific target organ toxicity – repeated exposure (GHS): no data available

Potential Health Effects

Inhalation: May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
- Skin: May be harmful if absorbed through skin. Causes skin burns.
- Eyes: Causes eye burns. Causes severe eye burns.

Reproductive toxicity: no data available

TERATOCARCIogenesis:
- IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
- ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
- NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by NTP.
- OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: Reproductive toxicity – rat – Intraperitoneal: Effects on fertility: abortion
- Reproductive toxicity – rat – Intraperitoneal: Effects on fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)
- Reproductive toxicity – rat – Subcutaneous: Effects on fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants). Effects on fertility: litter size (e.g. # fetuses per litter; measured before birth)
- Reproductive toxicity – mouse – Oral: Effects on fertility: post-implantation mortality (e.g. reduction in number of implants per female; total number of implants per corpora lutea). Effects on embryo/fetus: Fetotoxicity (except death, e.g. stunted fetus). Specific developmental abnormalities: musculoskeletal system.

TERATOCARCIogenesis:
- Developmental toxicity – mouse – Intraperitoneal: Effects on embryo/fetus: Fetotoxicity (except death, e.g. stunted fetus).
- Specific developmental abnormalities: musculoskeletal system

Specific target organ toxicity – single exposure (GHS): no data available

Specific target organ toxicity – repeated exposure (GHS): no data available

Aspiration hazard: no data available

Potential Health Effects

Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
- Skin: May be harmful if absorbed through skin. May cause skin irritation.
- Eyes: May cause eye irritation.
- Ingestion: May be harmful if swallowed.

Aggravated Medical Condition: Avoid contact w/DMSO solutions containing toxic materials or materials with unknown toxicological properties. DMSO is readily absorbed through skin and may carry such materials into the body.

Signs and Symptoms of Exposure:
- Exposure may cause burning sensation, cough, wheezing, laryngitis, shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

Additional information: RTECS: AJ7875000

DMSO:
- Acute toxicity:
  - LD50 Oral – rat – 14,500 mg/kg
  - LD50 Inhalation – rat – 4 h – 40250 ppm
  - LD50 Dermal – rabbit – >5,000 mg/kg
- Skin corrosion/irritation: Skin – rabbit – no skin irritation – 4h
- Serious eye damage/eye irritation: Eyes – rabbit – mild eye irritation
- Respiratory or skin sensitization: no data available

Germ cell mutagenicity:
- Genotoxicity in vitro – mouse: lymphocyte: Cytogenetic analysis
- Genotoxicity in vitro – mouse: lymphocyte: Mutation in mammalian somatic cells
- Genotoxicity in vivo – rat – Intraperitoneal: Cytogenetic analysis
- Genotoxicity in vivo – mouse – Intraperitoneal: DNA damage

Carcinogenicity:
- IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
- ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
- NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by NTP.
- OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: Reproductive toxicity – rat – Intraperitoneal: Effects on fertility: abortion

Reproductive toxicity – rat – Intraperitoneal: Effects on fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)

Reproductive toxicity – rat – Subcutaneous: Effects on fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants). Effects on fertility: litter size (e.g. # fetuses per litter; measured before birth)

Reproductive toxicity – mouse – Oral: Effects on fertility: post-implantation mortality (e.g. reduction in number of implants per female; total number of implants per corpora lutea). Effects on embryo/fetus: Fetotoxicity (except death, e.g. stunted fetus). Specific developmental abnormalities: musculoskeletal system.

TERATOCARCIogenesis:
- Developmental toxicity – mouse – Intraperitoneal: Effects on embryo/fetus: Fetotoxicity (except death, e.g. stunted fetus).
- Specific developmental abnormalities: musculoskeletal system

Specific target organ toxicity – single exposure (GHS): no data available

Specific target organ toxicity – repeated exposure (GHS): no data available

Aspiration hazard: no data available

Potential Health Effects

Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
- Skin: May be harmful if absorbed through skin. May cause skin irritation.
- Eyes: May cause eye irritation.
- Ingestion: May be harmful if swallowed.

Aggravated Medical Condition: Avoid contact w/DMSO solutions containing toxic materials or materials with unknown toxicological properties. DMSO is readily absorbed through skin and may carry such materials into the body.

Signs and Symptoms of Exposure:
- Effects due to ingestion may include: nausea, fatigue, and/or headache.

Additional information: RTECS: PV6210000

SECTION 12: ECOLOGICAL INFORMATION

Trichloroacetic acid:
- Persistence and degradability: Biodegradability (Zahn–Wellens Test): Result: 5% - not readily biodegradable
- Toxicity: Toxicity to fish: LC50 – Pimephales promelas (fathead minnow) – 2,000 mg/l – 96 h
- Toxicity to daphnia and other aquatic invertebrates: EC50 – Daphnia magna (Water flea) – 1,460-2,000 mg/l – 48 h
- Bioaccumulative potential: no data available
- Mobility in soil: no data available
- PBT and vPvB assessment: no data available

Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
SAFETY DATA SHEET
Cat# K461-100 Methylglyoxal Assay Kit

Very toxic to aquatic life with long lasting effects.

DMSO:
Elimination information (persistence and degradability): no data available
Ecotoxicity effects: Toxicity to fish: LC50 - Pimephales promelas (fathead minnow) - 34,000 mg/l - 96 h
LC50 - Oncorhynchus mykiss (rainbow trout) - 35,000 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia pulex (Water flea) - 27,500 mg/l
Toxicity to algae: EC50 - Lepomis macrochirus (Bluegill) - > 400,000 mg/l - 96 h
Further information on ecology: no data available

SECTION 13: DISPOSAL CONSIDERATIONS

Product: Observe all federal, state, and local environmental regulations.
Contaminated packaging: Dispose of as unused product.

SECTION 14: TRANSPORT INFORMATION

Trichloroacetic acid:
DOT (US): UN-number: 1839, Class: 8, Packing group: II; Proper shipping name: Trichloroacetic acid; Marine pollutant: No; Poison inhalation hazard: No
IMDG: UN-number: 1839, Class: 8, Packing group: II; EMS-No: F-A, S-B; Proper shipping name: TRICHLOROACETIC ACID; Marine pollutant: No
IATA: UN-number: 1839, Class: 8, Packing group: II; Proper shipping name: Trichloroacetic acid

DMSO:
DOT (US): UN-Number: 1993 Class: CBL Packing group: III; Proper shipping name: Combustible liquid, n.o.s. (Dimethyl sulfoxide); Marine pollutant: No; Poison Inhalation Hazard: No
IMDG: Not dangerous goods.
IATA: Not dangerous goods.

SECTION 15: REGULATORY INFORMATION

Gentamicin ELISA kit:
SARA 302 Components: SARA 302: No chemical in this material is subject to the reporting requirements of SARA Title III, Section 302.
SARA 313 Components: SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title II, Section 313.
SARA 311/312 Hazards: Trichloroacetic acid: Acute Health Hazard, Chronic Health Hazard
DMSO: Fire Hazard, Chronic Health Hazard
Massachusetts Right To Know Components: No components are subject to the Massachusetts Right to Know Act.
Pennsylvania Right To Know Components: Trichloroacetic acid: CAS-No. 76-03-9; Revision Date: 2007-03-1
Dimethyl sulfoxide CAS-No. 67-68-5; Revision Date: 2007-03-01
New Jersey Right To Know Components: Trichloroacetic acid: CAS-No. 76-03-9; Revision Date: 2007-03-1
Dimethyl sulfoxide CAS-No. 67-68-5; Revision Date: 2007-03-01
California Prop. 65 Components: This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.
EU regulations: This product is not classified according to the EU regulations.

<table>
<thead>
<tr>
<th>Component</th>
<th>Risk Phrases</th>
<th>Safety Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trichloroacetic acid</td>
<td>R35, R50/53</td>
<td>S26, S36/37/39, S45, S60, S61</td>
</tr>
<tr>
<td>DMSO</td>
<td>R10, R36/37/38</td>
<td>S24/25, S36/37/39, S45</td>
</tr>
</tbody>
</table>

SECTION 16: OTHER INFORMATION

DISCLAIMER:
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. BioVision, Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.