THERION BIOLOGICS

MATERIAL SAFETY DATA SHEET

SECTION 1 – IDENTIFICATION OF PRODUCT AND COMPANY

Therion Biologics Corporation
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Telephone 617-876-7779
Hours of Operation Monday through Friday, 8:30 a.m. – 5:00 p.m. (Eastern Standard Time)

Product name Recombinant Vaccinia Vector

Description Human cancer vaccine, recombinant vaccinia virus containing genes encoding tumor antigens with or without genes encoding costimulatory molecules.

SECTION 2 - COMPOSITION

Ingredient	Amount
Live recombinant vaccinia virus of the Orthopoxvirus family	No Greater than 10^{10} pfu/vial

Note: This product contains phosphate buffer, saline, and glycerol at levels considered normal for pharmaceutical formulations. Traces of residual contaminants (such as egg albumin, nucleic acids, fetal bovine serum components from the viral manufacturing process) may be present. The contaminants are controlled to the level required for Investigational New Drugs.

SECTION 3 – HAZARDS IDENTIFICATION

General Recombinant vaccinia viruses are classified as Biosafety Level 2 organisms. They are infectious to humans and have been used in numerous clinical studies to treat cancer patients. The parental vaccinia virus was routinely used in U.S. for childhood vaccination against smallpox until 1971.

Eye effects Exposure of eyes may result in recombinant virus infection of the conjunctiva and corneal tissues.

Skin effects Exposure of unbroken skin is unlikely to result in recombinant virus infection. Exposure of irritated skin may result in recombinant virus infection.

Inhalation effects None known.

Ingestion effects None known.

Other potential health effects Exposure of individuals with eczema or other inflammatory skin conditions may result in disseminated recombinant virus infection beyond the site of exposure. Individuals with impaired immune responses may be at increased risk for generalized

	infection due to the recombinant virus. Infrequent occurrence of postvaccinal encephalitis has been reported with smallpox vaccination. The risk for such adverse reactions to Therion recombinant vaccinia vaccines is not known.
Route of entry	Skin or eye contact and accidental injection

SECTION 4 – FIRST AID MEASURES

Skin	In case of contact, skin should be cleaned with a standard hand-washing detergent.
Eyes	In the case of contact, flush eyes with water for 15 minutes and seek medical advice.
Inhalation	None. Estimate dose of exposure and seek medical advice.
Ingestion	None. Estimate dose of exposure and seek medical advice.
Vaccinia infection	If evidence of infection with recombinant pox virus occurs seek medical attention.
Note to physician	If generalized or other systemic infection occurs, contact the Centers for Disease Control and Prevention. Vaccinia immune globulin treatment may be indicated.

SECTION 5 – FIRE FIGHTING MEASURES

General hazard	This product is a nonflammable aqueous solution and will not support combustion.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

General	Review sections 3, 8 and 11 before proceeding with clean up.
Accidental Release	Contain the source of the spill or leak. Use absorbent material to absorb liquid from contaminated surface. Dispose of absorbent materials in biohazard bags, review section 13. Clean contaminated surface with detergent based cleaners or 10% Clorox. Dispose of cleaning materials in biohazard bags. Individuals involved in clean up should wear protective clothing including gloves, eye protection and laboratory coat.

SECTION 7 – HANDLING AND STORAGE

General handling	Handling of recombinant vaccinia virus in tissue culture or in open containers requires the use of BSL2 laboratories. Aseptic loading of vaccine from sealed vaccine vials into appropriate syringes can be performed in standard clinical facilities.
Storage conditions	Vaccine should be stored at -70°C or colder.

SECTION 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION

Facilities	Handling of virus in open containers such as during virus culture or other manipulation requires BSL2 laboratory facilities. Handling of sealed vaccine vials and loading of syringes for administration of vaccine by injection may be conducted in standard clinical facilities.
Prophylactic vaccinia vaccination	Health care workers administering recombinant vaccinia vaccines or having contact with contaminated dressings may be offered prophylactic vaccination with smallpox vaccine.
Contraindications	Individuals who are pregnant, have eczema or other exfoliative skin conditions or are immunocompromised should not handle recombinant vaccinia vaccines or come in contact with contaminated dressings.
Respiratory protection	None required.
Eye protection	Eye protection is recommended during handling to prevent accidental contact.
Skin protection	For handling of vaccine no special protective clothing is required. Standard laboratory or clinical smock is recommended.
Hand protection	Vaccine should be handled using impervious gloves to prevent accidental skin exposure.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Physical form	Frozen
Color	Cloudy white to gray

SECTION 10 – STABILITY AND REACTIVITY

Reactivity	Recombinant vaccinia viruses are non-reactive with nonliving materials.
Conditions to avoid	Avoid dilution of vaccine with materials other than those noted in the clinical protocol. Unapproved diluents may result in significant loss of titer. Do not store at room temperature. Avoid storage of undiluted vaccine at 2°C - 8°C for longer than 4 days.
Stability	Stable at -70°C or colder. Ongoing stability studies will be conducted.
Hazardous decomposition products	None known

SECTION 11 – TOXICOLOGY INFORMATION

Toxicology summary

Murine Neurovirulence	Vaccinia recombinants are less virulent in mouse

	neurovirulence studies than approved small pox vaccine (DryVax®).
Murine Multiple Dose Studies	Studies in mice with vaccinia recombinants have not resulted in significant adverse effects.
Nonhuman Primate Safety Studies	Studies with rhesus monkeys have not resulted in significant adverse effects. Administration by the subcutaneous route or by skin scarification results in erythema, induration and pustule formation at the vaccination site, consistent with expected reactions to vaccinia.
Clinical Studies	Over 500 humans have been vaccinated with Therion vaccinia-based recombinants by either subcutaneous, intramuscular, skin scarification or intradermal routes. In approximately 50% of patients, erythema, induration and pustule formation at the site of vaccination occurs, consistent with the expected local reactions to vaccinia.
Reproductive Studies	Reproductive toxicology studies have not been conducted.

SECTION 12 – ECOLOGICAL INFORMATION

Environmental overview	This material is considered to be a biohazard and as such release to the environment should be avoided.

SECTION 13 – DISPOSAL INFORMATION

Disposal procedure	Observe all local and federal regulations regarding disposal of hazardous biological waste. Store materials in appropriate biohazard containers prior to disposal.

SECTION 14 – TRANSPORTATION INFORMATION

General shipping instructions	Recombinant vaccinia virus must be shipped according to all state and federal regulations as a biological product for investigational use.

SECTION 15 – OTHER

Date prepared	July 29, 2003
Prepared by	Therion Biologics Corporation

Although the information, opinions and recommendations contained in this Material Safety Data Sheet are compiled from sources believed to be reliable, Therion accepts no responsibility for the accuracy, sufficiency, or reliability for any loss or injury resulting from the use of the information. Newly discovered hazards are frequent and this information may not be completely up to date.

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