

# Safety Data Sheet

As required by 29 CFR 1910.1200, (EC) N. ° 1907/2006, (EC) N. ° 1272/2008

Version: 7  
Effective Date: 2.MAY.1996  
Revision Date: 3.NOV.2015

## Section 1: Product and Company Identification

Product Name : AVONEX<sup>®</sup> Lyophilized  
Chemical Name : Interferon beta-1a  
Intended Use : Biotherapeutic  
Company : Biogen  
250 Binney Street  
Cambridge MA, 02142  
(617) 679-2000  
Emergency Phone : CHEMTREC (800) 424-9300

## Section 2: Hazards Identification

Hazard Class / Category : Not Classified

### Other Hazard Information

Note: Avonex<sup>®</sup> is a recombinant form of the naturally produced protein interferon beta 1a. The final product is sold as a prescription, injectable drug in lyophilized powder form. AVONEX<sup>®</sup> Lyophilized is not considered hazardous per the criteria under the OSHA Hazard Communication Standard (29 CFR 1910.1200) or (EC) No. 1907/2006 and (EC) No. 1272/2008. Although the health effects of occupational exposure to this product are not fully known or characterized, no adverse effects are anticipated as a result of occupational or incidental exposure.

Human Serum Albumin, USP used in this formulation is derived from human plasma. Final product has been heated for 10 hours at 60°C. The Human Serum Albumin meets the requirements of the USP, EP and 21 CFR Part 640.81(e).

## Section 3: Composition / Information on Ingredients

Chemical Name	Concentration %	CAS No.	EC No.
Interferon beta-1a	<1	194739-10-1	Not available
Human Serum Albumin, USP	54	Not established	Not established
Sodium chloride	21	7647-14--5	231-598-3
Disodium Phosphate	20	7558-79-4	231-448-7
Monosodium phosphate	4	7558-80-7	231-449-2

Common Name / Synonyms :BG9418, recombinant human interferon beta, r-HuIFN- $\beta$

## Section 4: First Aid Measures

### Eyes

Flush with water for 15 minutes. Seek medical attention if irritation occurs/persists.

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## Skin

Remove contaminated clothing. Wash exposed area with water for 15 minutes. Seek medical attention if irritation occurs/persists.

## Inhalation

Move person to the fresh air. If not breathing give artificial respiration, treat symptomatically and supportively, get medical attention.

## Ingestion

Rinse mouth with water and seek medical attention, if required.

## Section 5: Fire Fighting Measures

### Suitable Extinguishing Media

Use water spray, carbon dioxide, ABC dry chemical or foam.

### Unsuitable Extinguishing Media / Unusual Risks

None Known

### Special Fire-Fighting Equipment for Fire-Fighters

No data available

## Section 6: Accidental Release Measures

### Personal Precautions and Protection

Wear impervious gloves, lab coat and safety glasses.

### Environmental Precautions

Do not allow product to spill into public drains / sewers.

### Clean Up Procedures

Place clean up debris in appropriate containers and dispose of in accordance with local, state and federal laws regarding waste management.

## Section 7: Storage and Handling

### Handling

Avoid direct contact.

### Storage

Store at 2-8°C. Can be stored at 25°C for up to 30 days if necessary. Do not expose to high temperatures. Following reconstitution, product should be used within 6 hours and stored at 2-8°C.

### Specific Uses

Prescription biotherapeutic drug; use as directed by a licensed health care provider.

## Section 8: Exposure Controls / Personal Protection

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## Exposure Routes

Inhalation, skin and eye contact; accidental ingestion or needlestick.

**Occupational Exposure Limits:** No OEL established, Occupational Exposure Band OEB1 (>500 µg/m<sup>3</sup>) as an 8-hour time weighted average.

## Other PPE

Wear impervious gloves, lab coat, and safety glasses to prevent skin and eye contact.

## Section 9: Physical and Chemical Properties

Molecular weight	: Not applicable for mixture
pH	: 7.3 (when reconstituted as a liquid)
Boiling point	: ~ 100°C
Melting point	: No data available
Vapor Pressure	: No data available
Solubility (water)	: Completely soluble
Solubility (other solvents)	: No data available
Evaporation rate	: Negligible when in reconstituted solution
Vapor density	: No data available
Specific gravity	: Not applicable
% volatile	: No data available
Partition coefficient	: No data available

Physical form: Lyophilized powder

Odor: None

Appearance/Color: White to off-white

## Section 10: Stability and Reactivity

**Stability:** Stable

### Incompatible materials / conditions

No data available

### Hazardous decomposition products

None known

### Hazardous polymerization

Will not occur

## Section 11: Toxicological Information

The chemical, physical and toxicological properties of this product have not been fully characterized. Avoid direct contact.

### Acute Toxicity

The most common adverse events in patients following administration of interferon beta-1a by intravenous, subcutaneous or intramuscular injection are flu-like symptoms, muscle ache, fever, chills and

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asthenia. Doses of up to 90 mcg (18MU) have been administered subcutaneously to human patients in clinical trials.

No mortality or significant toxicity was observed after single doses of 200 mcg/kg (40MU/kg) IV in rats; 330 mcg/kg IV and 990 mcg/kg (18MU/kg)SC in mice; 90 mcg/kg SC in guinea pigs; 15 mcg IM in rabbits or 50 mcg/kg SC in monkeys..

### Signs and Symptoms of Exposure

No mortality or signs of toxicity

### Effects by inhalation, dermal contact, ingestion or eye contact

Minimal intramuscular irritation was observed in rabbits receiving a single IM injection of Avonex<sup>®</sup>. This degree of irritation is typical of the trauma expected with any IM injection.

### Sensitization

Interferon beta-1a produced no sensitizing properties in the skin of guinea pigs.

### Chronic Toxicity

Recombinant human interferon beta-1a was well tolerated in rhesus monkeys following daily repeat (2 to 9 weeks) subcutaneous administration up to 50 mcg/kg (10MU/kg), excluding expected fever and antibody production to both human serum albumin and recombinant human interferon beta. Slight, but reversible decreases in platelets were observed in monkeys at the 50 mcg/kg dose level

### Carcinogenicity

No data available. After approximately 2 weeks of treatment, the monkeys developed a neutralizing antibody response to interferon beta-1a; for this reason, chronic repeat dose toxicity testing with interferon beta-1a alone was not performed. Interferon beta-1a is not listed as a carcinogen by OSHA, NTP or IARC

### Genotoxicity

Interferon beta 1a was negative in the Ames microbial mutagenicity test and in an in-vivo cytogenetic assay in human lymphocytes in presence and absence of metabolic activation.

### Reproductive and Developmental Toxicity:

No male fertility studies have been performed in male rhesus monkeys, but there is no published information to suggest that interferons would have an effect on testicular function. In a female fertility study of interferon beta-1a in rhesus monkeys 4 of the 6 monkeys dosed SC at 33 mcg/kg daily for 5 consecutive cycles failed to ovulate during the treatment cycle. Ovarian function returned during the subsequent 2 post-treatment cycles suggesting that anovulation related to the test article was reversible. The NOEL was 0.8 mcg/kg.

The reproductive toxicity of interferon beta 1a has not been studied in humans. In pregnant monkeys given interferon beta 1a at 100 times the recommended weekly human dose, no teratogenic or other adverse effects on fetal development were observed. Abortifacient activity was evident following 3 to 5 doses at this level. No abortifacient effects were observed in monkeys treated at 2 times the recommended weekly human dose. Treatment of monkeys with interferon beta 1a at 2 times the recommended weekly human dose had no effects on cycle duration or ovulation.

**Target Organs:** No target organ toxicity

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### Section 12: Ecological Information

**Ecotoxicity:** No Data Available

**Mobility:** No Data Available

**Environmental persistence:** No Data Available

**Bioaccumulation:** No Data Available

### Section 13: Disposal Considerations

#### Product Disposal

Avonex<sup>®</sup> is not a RCRA hazardous waste as defined by US EPA.

#### Packaging Disposal

Dispose of in accordance with applicable federal, state and local regulations.

#### Other regulatory information

None

### Section 14: Transport Information

#### ICAO / IATA

Proper Shipping Name, Class, UN Number, Packing Group  
Non Hazardous

#### RID / ADR / DOT

Proper Shipping Name, Class, UN Number, Packing Group  
Non Hazardous

#### IMDG

Proper Shipping Name, Class, UN Number, Packing Group  
Non Hazardous

### Section 15: Regulatory Information

The Human Serum Albumin used in the formulation of Avonex<sup>®</sup> meets the requirements of the USP, EP and 21 CFR Part 640.81(e)

REACH (EU regulations) : *As a medicinal product;*  
Restrictions on use - Not applicable  
Authorization - Not applicable

OSHA Classification : None

R Phrases : None

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S Phrases : None

### **Section 16: Other Information**

DISCLAIMER: The above mentioned data are based on Biogen's best present knowledge of this product. Biogen cannot guarantee completeness or accuracy of the information contained herein, and disclaims all liability for incompleteness or inaccuracy of the information and for any claims of damages arising from handling or use of this product.

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