



## Certificate of Origin

Catalog Number	Product Name	Lot Number	Animal-Free (No animal or human-origin components)
100-209AF	Animal-Free Human TGF- $\alpha$	1117-100-209AF	Yes
100-209	Human TGF- $\alpha$	1117-100-209	Yes

**Documentation Date:** February 6, 2020

**Harmonizing Code:** 3822000002

**Country of Origin:** USA

**Manufacture:**

Shenandoah Biotechnology  
101 Camars Drive  
Warwick, PA 18974  
USA

This recombinant protein was manufactured at Shenandoah Biotechnology in Warwick, Pennsylvania, USA. It was expressed in *E.coli*, grown in plant-based media, and purified.

This product is supplied carrier free. No materials of animal or human origin were used in the manufacture of this recombinant protein. In addition, no animal-derived materials were used in the manufacture of the raw materials used in the manufacture of the recombinant protein and no viral testing was done.

**Type of Manufacture (ie. chemical synthesis, fermentation, biological extraction/purification):**

This product is a recombinant protein produced by fermentation in plant-based media and purification protocols.

**Sub-Type (If chemical, organic or inorganic? If fermentation, microbial or plant?):** Microbial expression

**Always non-animal source:** Yes. This product is produced with no animal-derived or human-derived raw materials, and during all processing and handling, all equipment and protocols are devoid of animal/human raw material components.

**Is there any comingling with other animal materials in manufacturing process:** No

**Viral Testing:** No

**Carrier Protein:** No

**Genetically Modified Organism:** This product is derived from a genetically modified organism, in which human, mouse or rat genes have been added to *E.coli*, with the purpose of producing genetically engineered research products.

**Expiration Date:**

12 months from date of receipt when stored at -20°C to -80°C as supplied.

1 month when stored at 4°C after reconstituting as directed.

3 months when stored at -20°C to -80°C after reconstituting as directed.

X Martin P. Keough, PhD (2020-02-07)

Martin Keough, PhD (YYYY-MM-DD)  
Chief Scientific Officer