

Certificate of Origin

Product: Recombinant Human Tumor Necrosis Factor Alpha (TNF-alpha)

Catalog Numbers: PHC3011, PHC3013, PHC3015, PHC3016, PHC3019

Country of Manufacture: These products are manufactured in the United States

Raw Material Information: The recombinant TNF-alpha is produced by bacterial fermentation of *E. coli*. The product contains no materials directly of animal origin. The product does utilize animal derived components in the manufacturing process.

Animal Derived Components: The fermentation feed contains tryptone derived from bovine milk of US or Australian origin. The fermentation media is sterilized at 122.5°C for 45 minutes, 15 psi. TNF-alpha is purified by immobilized metal affinity chromatography (non-animal). The leader sequence is cleaved by thrombin derived from human plasma. The serum is tested by the supplier to be negative for HB_sAg and for antibodies to HIV and HCV. The final purification step is by ion exchange chromatography.

For further information contact Technical Support at (800) 955-6288 or techsupport@invitrogen.com.

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