

## Certificate of Origin

**Product:** Recombinant Mouse Granulocyte Macrophage-Colony Stimulating Factor (GM-CSF)

**Catalog Numbers:** PMC2011, PMC2013, PMC2014, PMC2015, PMC2016

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

**Raw Material Information:** The recombinant GM-CSF 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. GM-CSF is purified by immobilized metal affinity chromatography (non-animal) and ion exchange chromatography. The leader sequence is cleaved by thrombin derived from human plasma. The serum is tested by the supplier to be negative for HB<sub>s</sub>Ag and for antibodies to HIV and HCV. The final purification step is by reverse phase chromatography.

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

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