R&D SYSTEMS
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Recombinant Human/Mouse/Rat Activin A

Catalog Number: 338-AC

DESCRIPTION

Source	Chinese Hamster Ovary cell line, CHO-derived Gly311-Ser426 Accession # P08476
N-terminal Sequence Analysis	Gly311
Structure / Form	Disulfide-linked homodimer
Predicted Molecular Mass	13 kDa (monomer)

SPECIFICATIONS

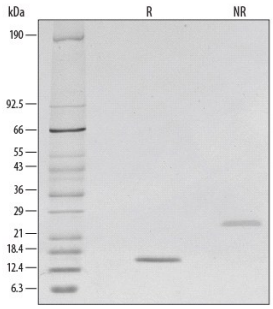
SDS-PAGE	14 kDa, reducing conditions 24 kDa, non-reducing conditions
Activity	Measured by its ability to induce hemoglobin expression in K562 human chronic myelogenous leukemia cells. Schwall, R.H. *et al.* (1991) Method Enzymol. **198**:340. The ED_{50} for this effect is typically 0.2-1.2 ng/mL. The specific activity of Recombinant Human/Mouse/Rat Activin A is approximately 1 IU/µg, which is calibrated against human Activin A WHO International Standard (NIBSC code: 91/626).
Endotoxin Level	<0.01 EU per 1 µg of the protein by the LAL method.
Purity	>95%, by SDS-PAGE with silver staining.
Formulation	Lyophilized from a 0.2 µm filtered solution in Acetonitrile and TFA with BSA as a carrier protein. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution	Reconstitute at 100-500 µg/mL in sterile 4 mM HCl.
Shipping	The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below.
Stability & Storage	**Use a manual defrost freezer and avoid repeated freeze-thaw cycles.** • 12 months from date of receipt, -20 to -70 °C as supplied. • 1 month, 2 to 8 °C under sterile conditions after reconstitution. • 3 months, -20 to -70 °C under sterile conditions after reconstitution.

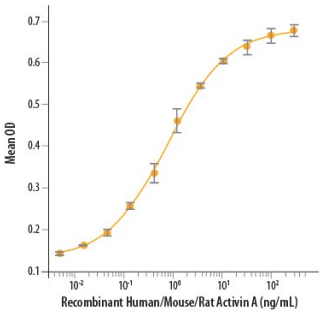
DATA

SDS-PAGE



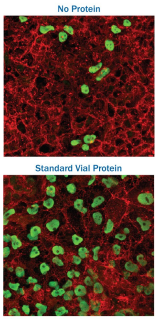
1 µg/lane of Recombinant Human/Mouse/Rat Activin A was resolved with SDS-PAGE under reducing (R) and non-reducing (NR) conditions and visualized by silver staining, showing single bands at 14 kDa and 24 kDa, respectively.

Bioactivity



Recombinant Human/Mouse/Rat Activin A (Catalog # 338-AC) induces hemoglobin expression in K562 human chronic myelogenous leukemia cells. The ED_{50} is typically 0.2-1.2 ng/mL.

Bioactivity



Recombinant Human/Mouse/Rat Activin A Promotes the Differentiation of Pluripotent Stem Cells into Endoderm. BG01V human embryonic stem cells were differentiated into endoderm using media supplemented with Recombinant Human/Mouse/Rat Activin A (Catalog # 338-AC). Control cells were cultured in medium without recombinant Activin A. Differentiation into endoderm was confirmed by positive-staining for Claudin-6 (red) and Sox17 (green) using the Mouse Anti-Human Claudin-6 Monoclonal Antibody (Catalog # MAB3656) and the Goat Anti-Human Sox17 Polyclonal Antibody (Catalog # AF1924), respectively. BG01V human embryonic stem cells are licensed from ViaCyte, Inc.

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BACKGROUND

Activin and Inhibin are members of the TGF-β superfamily of cytokines and are involved in a wide range of biological processes including tissue morphogenesis and repair, fibrosis, inflammation, neural development, hematopoiesis, reproductive system function, and carcinogenesis (1-7). Activin and Inhibin are produced as precursor proteins. Their amino terminal propeptides are proteolytically cleaved and facilitate formation of disulfide-linked dimers of the bioactive proteins (8, 9). Activins are nonglycosylated homodimers or heterodimers of various β subunits (βA, βB, βC, and βE in mammals), while Inhibins are heterodimers of a unique α subunit and one of the β subunits. Activin A is a widely expressed homodimer of two βA chains. The βA subunit can also heterodimerize with a βB or βC subunit to form Activin AB and Activin AC, respectively (10). The 14 kDa mature human βA chain shares 100% amino acid sequence identity with bovine, feline, mouse, porcine, and rat βA. Activin A exerts its biological activities by binding to the type 2 serine/threonine kinase Activin RIIA which then noncovalently associates with the type 1 serine/threonine kinase Activin RIB/ALK-4 (7, 11). Signaling through this receptor complex leads to Smad activation and regulation of activin-responsive gene transcription (7, 11). The bioactivity of Activin A is regulated by a variety of mechanisms (11). BAMBI, Betaglycan, and Cripto are cell-associated molecules that function as decoy receptors or limit the ability of Activin A to induce receptor complex assembly (12-14). The intracellular formation of Activin A can be prevented by the incorporation of the βA subunit into Activin AC or Inhibin A (3, 10). And the bioavailability of Activin A is restricted by its incorporation into inactive complexes with α2-Macroglobulin, Follistatin, and FLRG (15, 16).

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