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1. Description

Products	Human Activin A, research grade. Recombinant human activin A.						
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Content in µg	Order no.						
10	130-115-012						
25	130-115-013						
Biological activity	The ED ₅₀ is $\leq 2.5 \times 10^3$ ng/mL corresponding to an activity of $\geq 0.4 \times 10^3$ U/mg. ▲ Note: The ED ₅₀ is determined by inhibition assay using murine MPC-11 cells according to Phillips <i>et al.</i> ¹ The inhibition assay was calibrated with the reference reagent for human Activin A (NIBSC code 91/626) provided by the WHO/National Institute for Biological Standards and Control.						
Primary structure	Homodimer, covalently linked non-glycosylated polypeptide chains (116 amino acid residues).						
Molecular mass	25.9 kDa.						
Source	Produced in CHO cells.						
Product format	Lyophilized from a filtered (0.2 µm) buffer solution.						
Stabilizer	Mannitol and trehalose.						
Purity	>85% as determined by SDS-PAGE analysis.						
Endotoxin level	Low endotoxin (<1.0 EU/µg cytokine) as determined by Limulus Amebocyte Lysate (LAL) assay.						
Storage	Lyophilized Human Activin A, research grade should be stored at -20 °C. The expiration date is indicated on the vial label. Upon reconstitution aliquots should be stored at -20 °C or below. Avoid repeated freeze-thaw cycles.						
Reconstitution	It is recommended to reconstitute lyophilized Human Activin A, research grade with deionized sterile-filtered water to a final concentration of 0.1–1.0 mg/mL in a minimal volume of 100 µL. Further dilutions should be prepared with 0.1% bovine serum albumin (BSA) or human serum albumin (HSA) in phosphate-buffered saline.						

1.1 Background information

Activin A is a member of the TGF-β superfamily and is involved in a wide range of biological processes like growth and differentiation of several tissues. It has been described to affect embryogenesis and hematopoiesis and is necessary for the maintenance of self-renewal and pluripotency of human embryonic stem cells (hESCs). It supports long-term feeder and serum-free growth of hESCs. Activin A induces the expression of Oct4, Nanog, Nodal, Wnt3, FGF-2, and FGF-8 and suppresses the BMP signal. It also controls the expression and secretion of hormones like follicle stimulating hormone (FSH), prolactin, and ACTH (corticotropin). The amino acid sequence of human, mouse, and rat activin A shares 100% identity.

1.2 Applications

Human Activin A can be used for a variety of applications, including:

- Maintenance of pluripotency of embryonic stem cells under feeder- and serum-free conditions.
- Differentiation of embryonic stem cells and iPS cells.
- Stimulation and differentiation of mesenchymal cells.

Optimal concentration for a specific application should be determined by a dose-response experiment.

2. References

1. Phillips, D. J. *et al.* (1999) A sensitive and specific *in vitro* bioassay for activin using a mouse plasmacytoma cell line, MPC-11. *J. Endocrinol.* 162 (1): 111–116.

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