

PRODUCT INFORMATION



PAD4 (human, recombinant; mammalian expressed)

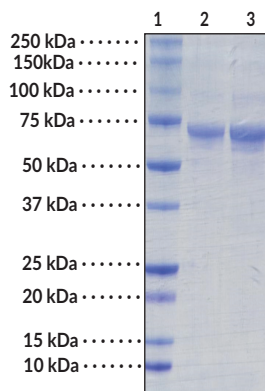
Item No. 32834

Overview and Properties

Synonyms:	PADI4, PADI5, Peptidylarginine Deiminase 4, Protein Arginine Deiminase Type 4, Protein Arginine Deiminase Type IV
Source:	Active recombinant N-terminal His-tagged human PAD4 expressed in HEK293 cells
Amino Acids:	2-663 (full length)
Uniprot No.:	Q9UM07
Molecular Weight:	76.2 kDa
Storage:	-80°C (as supplied)
Stability:	≥1 year
Purity:	<i>batch specific</i> (≥90% estimated by SDS-PAGE)
Supplied in:	50 mM HEPES, pH 8.0, 300 mM sodium chloride, 1 mM DTT, and 10% glycerol
Endotoxin Testing:	<1.0 EU/μg, determined by the LAL endotoxin assay
Protein Concentration:	<i>batch specific</i> mg/ml
Activity:	<i>batch specific</i> U/ml
Specific Activity:	<i>batch specific</i> U/mg
Unit Definition:	One unit is defined as the amount of enzyme required to produce 1 nmol of NH ₄ ⁺ per minute at 37°C in 50 mM HEPES, pH 7.7, containing 10 mM calcium chloride, 5 mM DTT, and 2 mM N-Benzoyl-L-Arginine Ethyl Ester (BAEE).

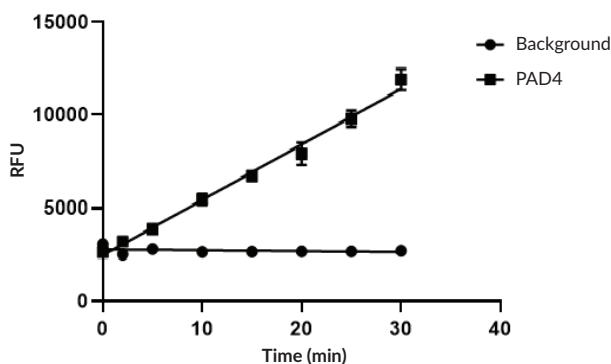
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Images



Lane 1: MW Markers
Lane 2: PAD4 (2 μg)
Lane 3: PAD4 (4 μg)

Representative gel image shown; actual purity may vary between each batch.



PAD4 activity was determined using Cayman's PAD4 Inhibitor Screening Assay Kit (Item No. 700560) with 0.25 μg PAD4 and 2 mM BAEE substrate.

WARNING
THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA
This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

WARRANTY AND LIMITATION OF REMEDY
Buyer agrees to purchase the material subject to Cayman's Terms and Conditions. Complete Terms and Conditions including Warranty and Limitation of Liability information can be found on our website.

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Description

Protein arginine deiminase 4 (PAD4) catalyzes the conversion of arginine residues to citrulline within cellular protein substrates, resulting in the loss of a positive charge, which can alter protein structure and/or function.¹ It is expressed in neutrophils, as well as a variety of tissues, including the brain, liver, lung, and kidney.^{1,2,4} PAD4 has a key role in NETosis, a lytic form of cell death characterized by the release of neutrophil extracellular traps (NETs).¹ Upon neutrophil activation, PAD4 translocates to the nucleus where it citrullinates histones, initiating chromatin decondensation and the release of NETs.^{2,5,6} Neutrophils isolated from *Pad4*^{-/-} mice exhibit decreased citrullination of histone H3 under both basal and LPS-stimulated conditions and are defective for NET formation in response to stimulation with LPS, phorbol 12-myristate 13-acetate (PMA; Item No. 10008014), or hydrogen peroxide.⁵ *Pad4*^{-/-} mice exhibit larger lesions than wild-type mice in a model of necrotizing fasciitis induced by M1 group A *S. pyogenes* lacking the extracellular DNase Sda1. *Pad4*-deficient mice also exhibit reduced infarct size in a model of myocardial ischemia-reperfusion injury and reduced tumor growth in a Lewis lung carcinoma model.^{2,3} *PADI4* SNPs, including G55S, V82A, and G112A, are associated with rheumatoid arthritis in humans.⁷ Cayman's PAD4 (human, recombinant; mammalian expressed) protein contains the G55S, V82A, and G112A SNPs and can be used for ELISA, enzyme activity assay, and Western blot (WB) applications.

References

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4. Jones, J.E., Causey, C.P., Knuckley, B., *et al.* Protein arginine deiminase 4 (PAD4): Current understanding and future therapeutic potential. *Curr. Opin. Drug Discov. Devel.* **12(5)**, 616-627 (2009).
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6. Thiam, H.R., Wong, S.L., Qiu, R., *et al.* NETosis proceeds by cytoskeleton and endomembrane disassembly and PAD4-mediated chromatin decondensation and nuclear envelope rupture. *Proc. Natl. Acad. Sci. USA* **117(13)**, 7326-7337 (2020).
7. Suzuki, A., Yamada, R., Chang, X., *et al.* Functional haplotypes of *PADI4*, encoding citrullinating enzyme peptidylarginine deiminase 4, are associated with rheumatoid arthritis. *Nat. Genet.* **34(4)**, 395-402 (2003).

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