

# PRODUCT INFORMATION



## PAD4 (mouse, recombinant)

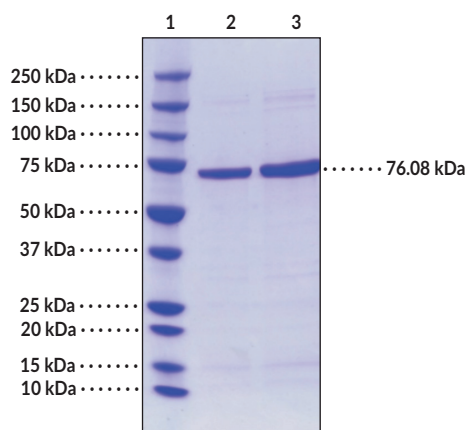
Item No. 28910

### Overview and Properties

<b>Synonyms:</b>	PADI4, PADI5, Peptidylarginine Deiminase 4, Protein Arginine Deiminase Type 4, Protein Arginine Deiminase Type IV
<b>Source:</b>	Active recombinant N-terminal His-tagged protein expressed in insect cells
<b>Amino Acids:</b>	2-666 AA (full length)
<b>Uniprot No.:</b>	Q9Z183
<b>Molecular Weight:</b>	76.08 kDa
<b>Storage:</b>	-80°C (as supplied); avoid freeze/thaw cycles by aliquoting protein
<b>Stability:</b>	≥1 year
<b>Purity:</b>	≥90% estimated by SDS-PAGE
<b>Supplied in:</b>	50 mM Tris HCl, pH 8.0, with 500 mM NaCl and 5% glycerol
<b>Protein Concentration:</b>	<i>batch specific</i> mg/ml
<b>Activity:</b>	<i>batch specific</i> U/ml
<b>Specific Activity:</b>	<i>batch specific</i> U/mg
<b>Unit Definition:</b>	One unit is defined as the amount of enzyme to produce 1 nmol of NH <sub>4</sub> <sup>+</sup> per minute at 37°C in 50 mM HEPES, pH 7.7, containing 10 mM calcium chloride, 5 mM DTT, and 2 mM N-α-benzoyl-L-arginine ethyl ester (BAEE).

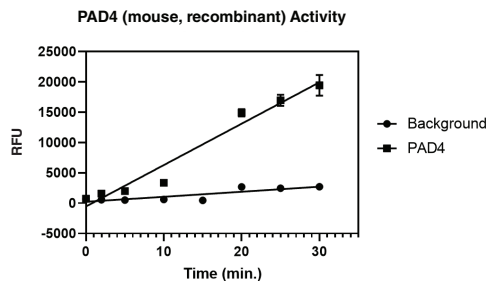
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

### 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.



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

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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.<sup>1</sup> It is expressed in neutrophils, as well as a variety of tissues, including the brain, liver, lung, and kidney.<sup>1,2,5</sup> PAD4 has a key role in NETosis, a lytic form of cell death characterized by the release of neutrophil extracellular traps (NETs).<sup>1</sup> Upon neutrophil activation, PAD4 translocates to the nucleus where it citrullinates histones, initiating chromatin decondensation and the release of NETs.<sup>2,3,6</sup> Neutrophils isolated from *Pad4*<sup>-/-</sup> 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.<sup>3</sup> *Pad4*<sup>-/-</sup> 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.<sup>2,4</sup> Serum PAD4 autoantibodies have been found in patients with rheumatoid arthritis and are associated with disease severity. Cayman's PAD4 (mouse, recombinant) can be used for ELISA, enzyme activity assay, and Western blot (WB) applications.

## References

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1. van Beers, J.J.B.C., Zendman, A.J.W., Rajmakers, R., *et al.* Peptidylarginine deiminase expression and activity in PAD2 knock-out and PAD4-low mice. *Biochimie* **95(2)**, 299-308 (2013).
2. Demers, M., Wong, S.L., Martinod, K., *et al.* Priming of neutrophils toward NETosis promotes tumor growth. *Oncoimmunology* **5(5)**, e1134073 (2016).
3. Li, P., Li, M., Lindberg, M.R., *et al.* PAD4 is essential for antibacterial innate immunity mediated by neutrophil extracellular traps. *J. Exp. Med.* **207(9)**, 1853-1862 (2010).
4. Savchenko, A.S., Borissoff, J.I., Martinod, K., *et al.* VWF-mediated leukocyte recruitment with chromatin decondensation by PAD4 increases myocardial ischemia/reperfusion injury in mice. *Blood* **123(1)**, 141-148 (2014).
5. 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).
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).

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