

PRODUCT INFORMATION



PAD2 (human, recombinant)

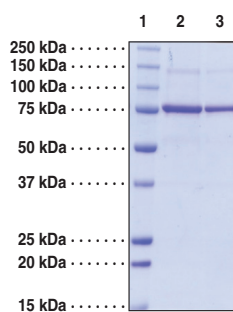
Item No. 10785

Overview and Properties

Synonyms: PADI2, PAD-H19, Peptidylarginine Deiminase 2, Protein Arginine Deiminase 2
Source: Active recombinant human N-terminal His-tagged PAD2 expressed in insect cells
Amino Acids: 1-665 (full length)
Uniprot No.: Q9Y2J8
Molecular Weight: 77.32 kDa
Storage: -80°C (as supplied); avoid freeze/thaw cycles by aliquoting protein
Stability: ≥1 year
Purity: ≥80% estimated by SDS-PAGE
Supplied in: 50 mM HEPES, pH 8.0, with 200 mM NaCl, 1 mM DTT and 10% glycerol
Protein
Concentration: *batch specific* mg/ml
Activity: *batch specific* U/ml
Specific Activity: *batch specific*; ≥500 U/mg
Unit Definition: One unit is defined as the amount of enzyme required to produce 1 nmol of NH₄⁺ per minute at 37°C in 50 mM HEPES, pH 7.7, containing 10 mM calcium chloride, 5 mM DTT, and 5 mM N-α-Benzoyl-L-Arginine ethyl ester (BAEE).

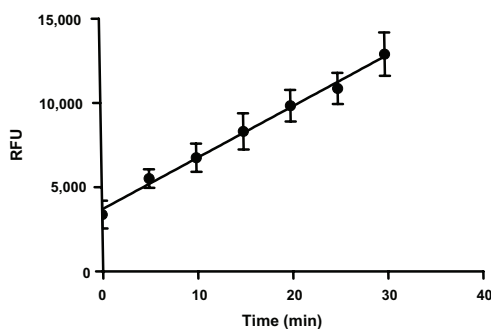
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Images

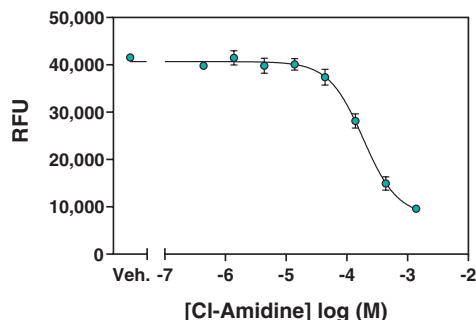


Lane 1: MW Markers
Lane 2: PAD2 (5 µg)
Lane 3: PAD2 (2 µg)

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



PAD2 Activity with 5 mM BAEE



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

Peptidyl arginine deiminase 2 (PAD2) 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 composed of an α/β propeller domain, an IgG1 domain that contains calcium binding sites, and an IgG2 domain. PAD2 changes conformation upon calcium binding to the IgG1 domain, which activates PAD2 and allows its substrates to bind.² It is ubiquitously expressed with high expression in the brain, spleen, muscle, and spinal cord and is localized primarily to the cytoplasm but can translocate to the nucleus in response to calcium signaling.^{1,3-5} PAD2 citrullinates non-histone proteins, such as glial fibrillary acid protein (GFAP), myelin basic protein (MBP), and retinoic acid receptor-related orphan receptor γ (ROR γ), as well as histone H3 at arginine 26 (H3R26), to regulate diverse processes ranging from myelination to immune function.³ *PADI2*, the gene encoding PAD2, is highly expressed in tumors from patients with breast cancer and associated with poor prognosis. It is also overexpressed in a variety of other cancers, including castration-resistant prostate, ovarian, and lung cancers, among others. PAD2 has been found in the synovial fluid of patients with rheumatoid arthritis (RA), and anti-PAD2 antibodies are associated with less severe RA than patients with autoantibodies to PAD4.⁴ Cayman's PAD2 (human recombinant) protein can be used for enzyme activity assays.

References

1. van Beers, J.J.B.C., Zendman, A.J.W., Raijmakers, R., *et al.* Peptidylarginine deiminase expression and activity in PAD2 knock-out and PAD4-low mice. *Biochimie* **95(2)**, 299-308 (2013).
2. Slade, D.J., Fang, P., Dreyton, C.J., *et al.* Protein arginine deiminase 2 binds calcium in an ordered fashion: Implications for inhibitor design. *ACS Chem. Biol.* **10(4)**, 1043-1 (2015).
3. Beato, M. and Sharma, P. Peptidyl arginine deiminase 2 (PADI2)-mediated arginine citrullination modulates transcription in cancer. *Int. J. Mol. Sci.* **21(4)**, 1351 (2020).
4. Curran, A.M., Naik, P., Giles, J.T., *et al.* PAD enzymes in rheumatoid arthritis: Pathogenic effectors and autoimmune targets. *Nat. Rev. Rheumatol.* **16(6)**, 301-315 (2020).
5. Zheng, L., Nagar, M., Maurais, A.J., *et al.* Calcium regulates the nuclear localization of protein arginine deiminase 2. *Biochemistry* **58(27)**, 3042-3056 (2019).

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