

Dipeptidyl Peptidase IV human, recombinant expressed in Sf9 cells

Catalog Number **D4943**
Storage Temperature $-20\text{ }^{\circ}\text{C}$

EC 3.4.14.5

Synonyms: DPPIV; dipeptidyl aminopeptidase IV; glycoprotein GP110; glycyproline aminopeptidase; CD26; T cell triggering molecule Tp103; X-PDAP; THAM; adenosine deaminase binding protein (ADAbp)

Product Description

This recombinant, human Dipeptidyl Peptidase IV product is the 105 kDa soluble form representing amino acid residues 29–766 with a C-terminal histidine tag.

Native DPPIV is a ubiquitous type II transmembrane glycoprotein and a serine protease of the S9 prolyl-oligopeptidase family. *In vivo*, it is synthesized with a signal peptide which functions as the membrane anchoring domain.^{1,2} There is an 88% sequence homology between the human and porcine kidney enzymes.³

Both the human and porcine kidney enzymes exist as homodimers with a subunit molecular mass of ~30 kDa. The high mannose 100 kDa DPPIV precursor is processed in the Golgi to yield a 124 kDa heavily N- and O-linked mature glycoprotein.⁴ It is then sorted to the apical membrane through the concerted action of both N- and O-linked glycans and association with lipid microdomains.⁵ The porcine enzyme contains 18.3% carbohydrates, of which the glycan composition is 0.9% fucose, 3.4% mannose, 5.1% galactose, 8.2% glucosamine, and 0.7% sialic acid.^{1,2}

Physiological Properties and Clinical Implications

DPPIV is highly expressed on endothelial and epithelial cells, and lymphocytes.⁸⁻¹⁰ It is also present in plasma in its soluble form.¹¹ DPPIV is involved in the regulation of several important physiological processes:¹²⁻¹⁴

- Immune system
- Inflammation
- CNS
- Endocrine functions
- Bone marrow mobilization
- Cancer growth
- Cell adhesion
- Glucose hemostasis
- Sepsis/severe infection

Natural DPPIV substrates:^{12,13}

Glucagon-like peptides-1 & 2
Glucose-dependent insulintropic peptide
Neuropeptide Y
Substance P
Peptide YY
IGF-1
Prolactin
hCG α
Growth Hormone Releasing Factor
LH α
Thyrotropin α
Enkephalins
Vasostatin
Eotaxin
Interferon- γ inducible protein
IFN-inducible T-cell alpha-chemoattractant
Procalcitonin15
Macrophage-derived chemokine
Monokine induced by Interferon- γ

Synthetic Substrates:

Arg-Pro *p*-nitroanilide
Catalog Number A1204
Gly-Pro 4-methoxy- β -naphthylamide
Catalog Number G9137
Gly-Pro 4-methoxy- β -naphthylamide
Catalog Number G9262
Gly-Pro *p*-nitroanilide hydrochloride
Catalog Number G0513
Gly-Pro *p*-nitroanilide *p*-toluenesulfonate salt
Catalog Number G2901
Gly-Pro-7-amido-4-methylcoumarin hydrobromide
Catalog Number G2761

Sigma determines the enzymatic activity of DPPIV using the chromogenic substrate Gly-Pro *p*-nitroanilide.

K_M values: Gly-Pro-2-naphthylamide²⁴ 0.66 mM
Ala-Ala-2-naphthylamide²³ 1 mM

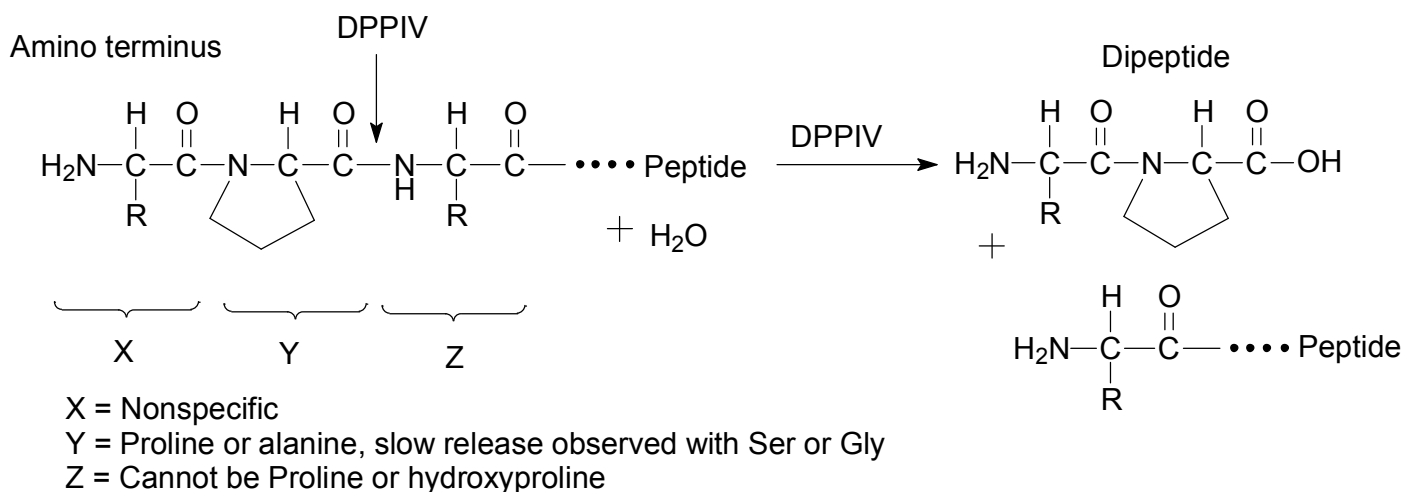
DPPIV inhibitors have been found to improve glucose tolerance and preserve islet function in mice.²⁰ DPPIV inhibitors were found to block entry of HIV-1 or HIV-2 into T lymphoblastoid and monocytoid cell lines.²¹

Synthetic Inhibitors:

Diisopropyl fluorophosphate
Catalog Number D0879
Phenylmethanesulfonyl fluoride
Catalog Number P7626
Ile-Pro-Ile (Diprotin A)
Catalog Number I9759
KR-62436
Catalog Number K4262

Specificity

DPPIV has a post-proline dipeptidyl aminopeptidase activity that hydrolyzes N-terminal dipeptides from the unsubstituted N-terminus of peptides with the sequence of X-Pro-Z and X-Ala-Z.



The product is supplied in a solution of 10 mM Tris-HCl, pH 7.6, 200 mM NaCl, 1 mM EDTA, and 10% glycerol.

Specific Activity: ≥10 units/mg protein

Unit Definition: One unit will produce 1.0 μmole of *p*-nitroaniline from Gly-Pro *p*-nitroanilide per minute at pH 7.6 at 37 °C.

Vial Content: ≥1.0 unit/vial

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Natural DPPIV ligands:^{12,16-19}

Adenosine deaminase-I and II
Renal Na⁺/H⁺ ion exchanger NHE³ isoform
Fibronectin

Optimum pH:^{13,22} 7.4–8.7

At pH 7.0 DPPIV exhibits ~45% of maximal activity, at pH 9.6 it exhibits ~90% of maximal activity, and below pH 5.0 the enzyme is essentially inactive.^{11,23}

Storage/Stability

This product ships on wet ice and storage at –20 °C is recommended. As supplied, it should be stable for a minimum of one year when stored properly at –20 °C.

References

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