

1 Nomenclature

EC number

3.5.1.106

Systematic name

N-formylmaleamic acid amidohydrolase

Recommended name

N-formylmaleamate deformylase

Synonyms

NicD <1> [1]

2 Source Organism

<1> *Pseudomonas putida* [1]

3 Reaction and Specificity

Catalyzed reaction

N-formylmaleamic acid + H₂O = maleamate + formate

Natural substrates and products

S N-formylmaleamic acid + H₂O <1> (<1> aerobic catabolism of nicotinic acid [1]) (Reversibility: ?) [1]

P maleamate + formate

Substrates and products

S N-formylmaleamic acid + H₂O <1> (<1> aerobic catabolism of nicotinic acid [1]; <1> S101, D125, and H245 are essential for the enzyme activity, constituting the catalytic triad of the NicD deformylase [1]) (Reversibility: ?) [1]

P maleamate + formate

4 Enzyme Structure

Subunits

? <1> (<1> x * 29000, SDS-PAGE [1]; <1> x * 29100, calculated from sequence [1]) [1]

5 Isolation/Preparation/Mutation/Application

Cloning

<1> (expression in Escherichia coli) [1]

Engineering

D125A <1> (<1> mutation leads to a complete loss of the deformylase activity [1]) [1]

E221A <1> (<1> 70% of wild-type deformylase activity [1]) [1]

H245A <1> (<1> mutation leads to a complete loss of the deformylase activity [1]) [1]

S101A <1> (<1> mutation leads to a complete loss of the deformylase activity [1]) [1]

References

- [1] Jimenez, J.; Canales, A.; Jimenez-Barbero, J.; Ginalska, K.; Rychlewski, L.; Garcia, J.; Diaz, E.: Deciphering the genetic determinants for aerobic nicotinic acid degradation: The nic cluster from *Pseudomonas putida* KT2440. *Proc. Natl. Acad. Sci. USA*, **105**, 11329-11334 (2008)