

Diamine oxidase (DAO)

D1440813

Storage: -20°C. Avoid freeze/thaw cycle. Store in the dark. Desiccated.

Product Description

Diamine oxidase (DAO), an enzyme present in the human body, catalyses the oxidation of diamines such as histamine, putrescine, and ethylenediamine to form aldehydes. It is also known as pyridoxal-containing amine oxidase or histamine oxidase. It plays a role in the metabolism of histamine and various polyamines. Its activity is closely linked to nucleic acid and protein synthesis in mucosal cells, reflecting the integrity and degree of damage to the intestinal mechanical barrier.

However, when endogenous diamine oxidase function is deficient or activity is insufficient, exogenous diamine oxidase supplementation becomes necessary. Porcine diamine oxidase, extracted from porcine kidney tissue, assists in breaking down histamine in food to alleviate histamine intolerance (HIT).

Product Efficacy

1. Mechanism of Action

Exogenous diamine oxidase compensates for endogenous deficiency by catalysing histamine degradation within the intestinal lumen. This prevents histamine absorption and subsequent histamine intolerance (HIT) symptoms.

2. Enzymatic Degradation Pathway

Diamine oxidase belongs to the copper-containing diamine oxidase family. Its catalysed degradation of histamine fundamentally involves an oxidative deamination reaction, converting biologically active histamine molecules into biologically inert metabolites—primarily imidazole aldehyde, ammonia, and hydrogen peroxide.

3. Site of Action

Diamine oxidase belongs to the copper-containing diamine oxidase family. Its catalysed degradation of histamine fundamentally involves an oxidative deamination reaction, converting biologically active histamine molecules into biologically inert metabolites—primarily imidazole aldehyde, ammonia, and hydrogen peroxide.

4. Substrate Specificity

The substrate specificity of diamine oxidase extends beyond histamine; it also catalyses the degradation of other biogenic amines, such as putrescine.

5. Bioavailability

As a protein-based enzyme preparation, diamine oxidase is not systemically absorbed. It exerts its effect locally within the digestive tract, thereby avoiding systemic side effects.

Multiple clinical studies support the effective management of histamine intolerance symptoms through exogenous diamine oxidase supplementation:

- Diamine oxidase belongs to the copper-containing diamine oxidase family. Its catalysed degradation of histamine fundamentally involves an oxidative deamination reaction, converting biologically active histamine molecules into biologically inert metabolites—primarily imidazole aldehyde, ammonia, and hydrogen peroxide.
- Maintz and Novak (2007) noted in a systematic review that exogenous diamine oxidase supplementation significantly increased dietary freedom in over 80% of histamine-intolerant patients, enabling safer consumption of foods containing moderate histamine levels. Concurrently, patients' quality of life scores (encompassing improvements in gastrointestinal, dermatological, neurological, and other multi-system symptoms) showed statistically significant enhancement. This provides crucial evidence-based support for the use of diamine oxidase supplements in symptom management for histamine intolerance patients.

Product Advantages

1. Regulatory Status

Diamine oxidase extracted from porcine kidney possesses a mature regulatory foundation. In the United States, porcine kidney diamine oxidase has obtained Generally Recognised as Safe (GRAS) notifications from the US Food and Drug Administration (FDA), such as GRN 000006 and GRN 1125.

2. Dosage Form Compatibility

Suitable for development in multiple dosage forms including tablets, capsules, and oral liquids, ensuring enzyme release and functional activity within the small intestine (the primary site of diamine oxidase action)

Product Safety

1. Authoritative Regulatory Evaluations

European Union (EFSA): Classified 'Porcine kidney protein extract (containing diamine oxidase)' as a Novel Food. United States (FDA): Although not approved as a medicinal product, it complies with NDI (New Dietary Ingredient) or GRAS (Generally Recognised as Safe) requirements under the Dietary Supplement framework, permitting market sale.

2. Authoritative Regulatory Evaluations

Acute toxicity: In rat studies, no lethal effects or significant toxic reactions were observed even at extremely high doses of porcine diamine oxidase. Subchronic toxicity: Animal studies involving 90 days of continuous high-dose diamine oxidase administration showed no pathological alterations in body weight, blood parameters, liver/kidney function, or organ tissues.

3. Clinical Trials and Human Tolerability

In human clinical trials involving subjects with 'histamine intolerance' and healthy volunteers: Adverse reactions were rare: The vast majority of subjects reported no side effects.



Minor side effects: The very few reported side effects were primarily mild gastrointestinal reactions (such as slight abdominal bloating), and it was often difficult to distinguish whether these were caused by the enzyme itself or the capsule excipients.

Vital signs: Long-term monitoring showed that taking this enzyme had no effect on vital signs such as blood pressure and heart rate.

