

# BIOTIN

## CELL GROWTH AND PRODUCTION



GLYMPIA  
Pharmaceuticals



## Carb, Fat and Protein Metabolism

### What is Biotin?

Biotin is a B-complex vitamin, also known as B7 or Vitamin H. Biotin is necessary for the cell growth and the production of fatty acids in living organisms.

### How Does It Work?

Biotin converts fatty acids and glucose into fuel to produce energy. It helps to produce enzymes by metabolizing amino acids and carbohydrates.

### What Does It Treat?

- Aids in healthy sweat glands
- Nerve tissue and bone marrow
- Strengthens hair and nails
- Aids in preventing hair loss
- Increases metabolism
- Speeds up weight loss
- Improves blood glucose

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### Dosing

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##### Adults (18 years and older)

- ⊗ **General:** The U.S. Food and Drug Administration (FDA) has not established a recommended dietary allowance (RDA) for biotin. The Food and Nutrition Board of the Institute of Medicine of the National Academies recommends a daily adequate intake (AI) of 30 micrograms in adults 19 years of age and older. In pregnant women 14 years of age and older, a daily AI of 30 micrograms is recommended. In breastfeeding women 14 years of age and older, a daily AI of 35 micrograms is recommended. Most healthy non-pregnant individuals with regular diets obtain these amounts of biotin through dietary consumption.
- ⊗ Treatment of biotin deficiency or inborn errors of metabolism should only take place under medical supervision.
- ⊗ In human research, single doses that are 600-fold greater than the normal dietary intake have been taken by mouth (2.1, 8.2, or 81.9 micromoles) or intravenously (18.4 micromoles) by healthy adults. Daily injections of at least 150 micrograms have been used to reverse experimental biotin deficiency. Five to 10 milligrams of biotin per kilogram daily has been used to treat biotin-responsive basal ganglia disease. A daily dose of 2.5 milligrams of biotin has been used to treat brittle nail syndrome. Biotin has been used as a skin- and hair-conditioning agent in cosmetic products at concentrations ranging from 0.0001% to 0.6%.

#### Allergies

- ⊗ Reports of allergy or anaphylaxis to biotin supplementation are rare.

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## Side Effects and Warnings

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- Biotin is a water-soluble, B-complex vitamin that is required in the human diet. It is likely safe at levels typically found in food. Supplementation with pharmacological doses of biotin is considered safe and has been associated with minor (mild gastrointestinal upset) or no side effects. One case of hives has been reported. Biotin is considered safe in cosmetic formulations.
- Use cautiously in patients, including children, taking anticonvulsants (such as carbamazepine, phenytoin, phenobarbital, primidone (Mysoline®), or valproic acid), as anticonvulsant therapy may accelerate biotin breakdown and cause biotin deficiency.
- Use cautiously in patients taking broad-spectrum antibiotics, such as sulfa drugs, as these may alter the intestinal bacteria that synthesize biotin.
- Use cautiously in patients taking cytochrome P450-modifying agents.
- Use cautiously in patients taking isotretinoin, as isotretinoin (Roaccutane®) may reduce biotinidase activity and cause biotin deficiency.
- Use cautiously in pregnant or breastfeeding women, due to a lack of available scientific evidence
- **Note:** Consumption of large amounts of raw egg white over months or years is likely to result in biotin deficiency. Raw egg white contains the protein avidin, which binds biotin tightly and prevents its absorption in the intestine.
- **Note:** Smoking may increase biotin breakdown in women and cause biotin deficiency.

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### Interactions

#### Interactions with Drugs

- ⊗ Biotin may lower blood sugar levels. Caution is advised when using medications that may also lower blood sugar. Patients taking insulin or drugs for diabetes by mouth should be monitored closely by a qualified healthcare professional, including a pharmacist. Medication adjustments may be necessary.
- ⊗ Biotin may interfere with the way the body processes certain drugs using the liver's cytochrome P450 enzyme system. As a result, the levels of these drugs may be increased in the blood and may cause increased effects or potentially serious adverse reactions. Patients using any medications should check the package insert and speak with a qualified healthcare professional, including a pharmacist, about possible interactions.
- ⊗ Biotin may also interact with broad-spectrum antibiotics (such as sulfa drugs, sulfathalidine), anticonvulsants (such as carbamazepine, phenytoin, phenobarbital, primidone (Mysoline®), or valproic acid), isotretinoin (Roaccutane®), or lipid- or cholesterol-lowering agents.
- ⊗ **Note:** Smoking may lead to accelerated biotin breakdown in women and cause marginal biotin deficiency.

#### Interactions with Herbs and Supplements

- ⊗ Biotin may lower blood sugar levels. Caution is advised when using herbs or supplements that may also lower blood sugar. Blood glucose levels may require monitoring, and doses may need adjustment.
- ⊗ Biotin may interfere with the way the body processes certain herbs or supplements using the liver's cytochrome P450 enzyme system. As a result, the levels of other herbs or supplements may become too high in the blood. It may also alter the effects that other herbs or supplements possibly have on the P450 system.
- ⊗ Biotin may also interact with chromium picolinate, lipid- or cholesterol-lowering agents, lipoic acid, pantothenic acid (vitamin B5), or raw egg whites.