

**AMOGHVARTA**

**ISSN : 2583-3189**



## **Biotin: A Comprehensive Review of its Role and Effects in the Human Body**

**ORIGINAL ARTICLE**



**Author**

**Akhilesh Chandra Verma**  
Department of Chemistry  
Government Naveen College  
Kui-Kukdur, Kabirdham, Chhattisgarh, INDIA

### **Abstract**

*Biotin, also known as vitamin B7 or vitamin H, is a water-soluble vitamin that plays a crucial role in various metabolic processes within the human body. This paper provides a comprehensive review of the biochemical functions, sources, metabolism, deficiency implications, and therapeutic uses of biotin. Additionally, it explores recent research findings regarding biotin supplementation and its potential health benefits.*

### **Key Words**

*Biotin, Effect, Human Body, Biochemical.*

### **Introduction**

Biotin, a member of the B-complex vitamin family, is essential for the metabolism of fats, carbohydrates, and proteins. Its involvement in various enzymatic reactions makes it indispensable for

maintaining optimal health. Despite being widely recognized for its role in promoting healthy hair, skin, and nails, biotin's physiological functions extend far beyond cosmetic benefits. This paper aims to delve into the multifaceted roles of biotin in human physiology and its implications for health.

### **Biochemical Functions of Biotin**

Biotin serves as a coenzyme in carboxylation reactions that are critical for the synthesis of fatty acids, gluconeogenesis, and amino acid metabolism. Through its interaction with biotin-dependent enzymes such as acetyl-CoA carboxylase and pyruvate carboxylase, biotin facilitates the conversion of substrates into forms usable by cells for energy production and cellular maintenance.

### **Dietary Sources and Metabolism**

Natural dietary sources of biotin include liver, egg yolks, nuts, seeds, and certain vegetables. Biotin obtained from these sources undergoes digestion and absorption primarily in the small intestine. Absorbed biotin is then transported to various tissues via the bloodstream, where it is either utilized immediately or stored in limited amounts in the liver.

### **Implications of Biotin Deficiency**

Biotin deficiency, though rare, can result from genetic disorders, prolonged antibiotic use, or excessive consumption of raw egg whites. Symptoms of biotin deficiency include dermatological issues (e.g., alopecia, dermatitis), neurological abnormalities (e.g., lethargy, hallucinations), and metabolic disturbances (e.g., impaired glucose tolerance).

## Therapeutic Uses and Health Benefits

In addition to its role as a dietary supplement for managing biotin deficiency, biotin has garnered attention for its potential therapeutic benefits in managing conditions such as diabetes, multiple sclerosis, and certain dermatological disorders. Research is ongoing to elucidate biotin's efficacy in these areas and to determine optimal dosage regimens.

## Conclusion

In conclusion, biotin is a vital micronutrient that contributes significantly to human health through its involvement in various metabolic pathways. While further research is needed to fully elucidate its therapeutic potential, current evidence underscores the importance of adequate biotin intake for maintaining optimal health and preventing deficiency-related disorders.

## References

1. Fernandes, M. S., Velangi, S. K., & Bhosle, D. (2013) Evaluation of serum biotinidase activity in hypothyroid patients, *Indian Journal of Endocrinology and Metabolism*, 17(Suppl 1), S262-S265. doi:10.4103/2230-8210.119582
2. Institute of Medicine (US) Standing Committee on the Scientific Evaluation of Dietary Reference Intakes and its Panel on Folate, Other B Vitamins, and Choline. (1998). Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. National Academies Press (US). PMID: 25057538
3. Mock, D. M. (2017) Biotin: From nutrition to therapeutics, *Journal of Nutrition*, 147(8), 1487S-1492S. doi:10.3945/jn.116.243673
4. Mock, D. M. (2018) Biotin: Mechanisms, assessment, and requirements, *American Journal of Clinical Nutrition*, 108(6), 1402S-1406S. doi:10.1093/ajcn/nqy196
5. Patel, D. P., Swink, S. M., & Castelo-Soccio, L. (2017) A review of the use of biotin for hair loss, *Skin Appendage Disorders*, 3(3), 166-169. doi:10.1159/00046298
6. Said, H. M., & Mohammed, Z. M. (2006) Intestinal absorption of water-soluble vitamins: An update, *Current Opinion in Gastroenterology*, 22(2), 140-146. doi:10.1097/01.mog.0000205387.32389.91
7. Soleymani, T., Lo Sicco, K., & Shapiro, J. (2017) Diet and hair loss: Effects of nutrient deficiency and supplement use, *Dermatology Practical & Conceptual*, 7(1), 1-10. doi:10.5826/dpc.0701a01
8. Trüeb, R. M. (2016) Serum biotin levels in women complaining of hair loss, *International Journal of Trichology*, 8(2), 73-77. doi:10.4103/0974-7753.188040
9. Watanabe, T., Kurokawa, M., & Yoshikawa, H. (2018) Enzymatic and structural characterization of biotin synthase from *Escherichia coli*, *Biochimica et Biophysica Acta (BBA) - Proteins and Proteomics*, 1866(3), 379-386. doi:10.1016/j.bbapap.2017.11.005
10. Zemleni, J., Hassan, Y. I., Wijeratne, S. S. K., & Biotin (2008) Biotin and biotinidase deficiency, *Expert Review of Endocrinology & Metabolism*, 3(6), 715-724. doi:10.1586/17446651.3.6.715

====00====