

Does SDR42E1 Affect Only Skin-Synthesized Vitamin D, or Also Oral Vitamin D?

Key Roles of SDR42E1

The gene **SDR42E1** plays a crucial role in both the production and processing of vitamin D, and its function is not limited to vitamin D made in the skin from sunlight.

Effects on Skin (UV/Sunlight) Vitamin D

- **SDR42E1 is highly expressed in skin keratinocytes**, the primary site where vitamin D₃ is synthesized from 7-dehydrocholesterol in response to UVB radiation.
- Studies have shown that disruption or mutation of SDR42E1 leads to the accumulation of 7-dehydrocholesterol and a decrease in skin vitamin D₃ production, directly linking SDR42E1 to the skin pathway for vitamin D synthesis^{[1] [2] [3] [4]}.

Effects on Oral (Dietary) Vitamin D

- Newer research **demonstrates that SDR42E1 is also essential for the absorption and metabolism of vitamin D from the gut**. This includes vitamin D obtained from food or supplements, which is initially absorbed by the intestines, converted to 25-hydroxyvitamin D in the liver, and finally to its active form in the kidneys.
- Inactivation of SDR42E1 in gut cell models impaired the uptake and further metabolism of orally supplied vitamin D, showing that this gene is necessary for the body to use oral vitamin D as well^{[5] [6] [7]}.
- Mutations in SDR42E1 are linked to vitamin D deficiency regardless of vitamin D source, confirming its broad impact^{[5] [7]}.

Summary Table

Pathway	SDR42E1's Role	Evidence
UV/Skin Synthesis	Regulates biosynthesis enzymes	Disruption leads to impaired skin D ₃ production ^{[1] [2] [4]}
Oral (Gut) Absorption/Metabolism	Assists in uptake/metabolism	Required for gut absorption and conversion ^{[5] [6] [7]}

Conclusion

SDR42E1 impacts both vitamin D produced in the skin (by sunlight/UV) and vitamin D obtained from oral sources (diet and supplements). A deficiency or mutation in this gene can cause low vitamin D levels no matter how vitamin D is acquired^{[5] [6] [7]}.

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1. <https://pmc.ncbi.nlm.nih.gov/articles/PMC11387231/>
2. <https://pubmed.ncbi.nlm.nih.gov/39263177/>
3. <https://www.sciencedirect.com/science/article/abs/pii/S0960076023002030>
4. [https://vitamindwiki.com/A_poor_gene_\(SDR42E1\)_can_greatly_reduce_Vitamin_D_from_the_sun_\(may_be_prevalent_in_the_Middle_East\)_-Aug_2024](https://vitamindwiki.com/A_poor_gene_(SDR42E1)_can_greatly_reduce_Vitamin_D_from_the_sun_(may_be_prevalent_in_the_Middle_East)_-Aug_2024)
5. <https://www.news-medical.net/news/20250718/Study-identifies-SDR42E1s-role-in-vitamin-D-pathway.aspx>
6. <https://www.sciencedaily.com/releases/2025/07/250718031208.htm>
7. <https://health.medicaldialogues.in/health/study-finds-vitamin-d-related-gene-that-could-help-treat-cancer-and-immune-diseases-151999>