

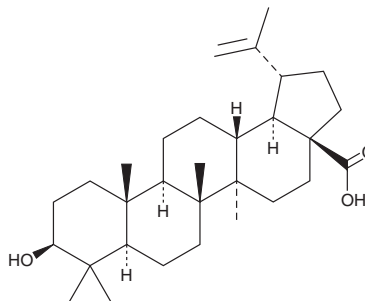
# PRODUCT INFORMATION



## Betulinic Acid

Item No. 11686

**CAS Registry No.:** 472-15-1  
**Formal Name:** 3 $\beta$ -hydroxy-lup-20(29)-en-28-oic acid  
**Synonyms:** Lupatic Acid, NSC 113090  
**MF:** C<sub>30</sub>H<sub>48</sub>O<sub>3</sub>  
**FW:** 456.7  
**Purity:**  $\geq$ 97%  
**Supplied as:** A solid  
**Storage:** 4°C  
**Stability:**  $\geq$ 4 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

### Laboratory Procedures

Betulinic acid is supplied as a solid. A stock solution may be made by dissolving the betulinic acid in the solvent of choice, which should be purged with an inert gas. Betulinic acid is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide. The solubility of betulinic acid in these solvents is approximately 0.5, 20, and 15 mg/ml, respectively.

Betulinic acid is sparingly soluble in aqueous buffers. For maximum solubility in aqueous buffers, betulinic acid should first be dissolved in DMSO and then diluted with the aqueous buffer of choice. Betulinic acid has a solubility of approximately 0.3 mg/ml in a 1:2 solution of DMSO:PBS (pH 7.2) using this method. We do not recommend storing the aqueous solution for more than one day.

### Description

Betulinic acid is a natural plant triterpenoid that is structurally related to mammalian bile acids. It is an agonist of the G protein-coupled bile acid receptor TGR5 ( $EC_{50} = 1 \mu\text{M}$ ), which might be linked with its ability to alter gene expression and fatty liver development in cells and mice given ethanol.<sup>1-3</sup> Betulinic acid also reduces NF- $\kappa$ B signaling and expression of microRNA-33 in LPS-treated macrophages, increasing levels of the ATP-binding cassette (ABC) cholesterol transporter ABCA1.<sup>4</sup> It also inhibits replication of HIV-1 ( $IC_{50} = 1.4 \mu\text{M}$ ) and has cytotoxic effects against cancer cells.<sup>3,5</sup>

### References

1. Genet, C., Strehle, A., Schmidt, C., *et al.* Structure-activity relationship study of betulinic acid, a novel and selective TGR5 agonist, and its synthetic derivatives: Potential impact in diabetes. *J. Med. Chem.* **53(1)**, 178-190 (2010).
2. Wan, Y., Jiang, S., Lian, L.-H., *et al.* Betulinic acid and betulin ameliorate acute ethanol-induced fatty liver via TLR4 and STAT3 *in vivo* and *in vitro*. *Int. Immunopharmacol.* **17(2)**, 184-190 (2013).
3. Kashiwada, Y., Hashimoto, F., Cosentino, L.M., *et al.* Betulinic acid and dihydrobetulinic acid derivatives as potent anti-HIV agents. *J. Med. Chem.* **39(5)**, 1016-1017 (1996).
4. Zhao, G.-J., Tang, S.-L., Lv, Y.-C., *et al.* Antagonism of betulinic acid on LPS-mediated inhibition of ABCA1 and cholesterol efflux through inhibiting nuclear factor- $\kappa$ B signaling pathway and miR-33 expression. *PLoS One* **8(9)**, e474782 (2013).
5. Mullauer, F.B., Kessler, J.H., and Medema, J.P. Betulin is a potent anti-tumor agent that is enhanced by cholesterol. *PLoS One* **4(4)**, (2009).

#### WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

#### SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the [complete](#) Safety Data Sheet, which has been sent via email to your institution.

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