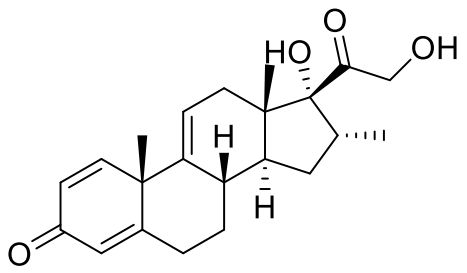
Product data sheet

MedKoo Cat#: 327030 Name: Vamorolone CAS#: 13209-41-1 Chemical Formula: $C_{22}H_{28}O_4$ Exact Mass: 356.1988 Molecular Weight: 356.462	
Product supplied as:	Powder
Purity (by HPLC):	≥ 98%
Shipping conditions	Ambient temperature
Storage conditions:	Powder: -20°C 3 years; 4°C 2 years.
	In solvent: -80°C 3 months; -20°C 2 weeks.

1. Product description:
Vamorolone, also known as VBP-15, is an anti-inflammatory compound used in the treatment of muscular dystrophy. Vamorolone is hoped to retain the beneficial anti-inflammatory and muscle strengthening aspects of corticosteroids, while decreasing or eliminating many of the undesirable side effects (bone fragility, stunted growth, insulin resistance).

2. CoA, QC data, SDS, and handling instruction
SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under "QC And Documents" section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMSO	62.5	175.34

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	2.81 mL	14.03 mL	28.05 mL
5 mM	0.56 mL	2.81 mL	5.61 mL
10 mM	0.28 mL	1.40 mL	2.81 mL
50 mM	0.06 mL	0.28 mL	0.56 mL

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator
Please refer the product web page under section of "Calculator"

6. Recommended literature which reported protocols for in vitro and in vivo study
In vitro study

1. Heier CR, Damsker JM, Yu Q, Dillingham BC, Huynh T, Van der Meulen JH, Sali A, Miller BK, Phadke A, Scheffer L, Quinn J, Tatem K, Jordan S, Dadgar S, Rodriguez OC, Albanese C, Calhoun M, Gordish-Dressman H, Jaiswal JK, Connor EM, McCall JM, Hoffman EP, Reeves EK, Nagaraju K. VBP15, a novel anti-inflammatory and membrane-stabilizer, improves muscular dystrophy without side effects. EMBO Mol Med. 2013 Oct;5(10):1569-85. doi: 10.1002/emmm.201302621. Epub 2013 Sep 9. PMID: 24014378; PMCID: PMC3799580.

2. Heier CR, Yu Q, Fiorillo AA, Tully CB, Tucker A, Mazala DA, Uaesoontrachoon K, Srinivassane S, Damsker JM, Hoffman EP, Nagaraju K, Spurney CF. Vamorolone targets dual nuclear receptors to treat inflammation and dystrophic cardiomyopathy. Life Sci Alliance. 2019 Feb 11;2(1):e201800186. doi: 10.26508/lsa.201800186. PMID: 30745312; PMCID: PMC6371196.

In vivo study

1. Dillingham BC, Knoblach SM, Many GM, Harmon BT, Mullen AM, Heier CR, Bello L, McCall JM, Hoffman EP, Connor EM, Nagaraju K, Reeves EKM, Damsker JM. VBP15, a novel anti-inflammatory, is effective at reducing the severity of murine experimental autoimmune encephalomyelitis. Cell Mol Neurobiol. 2015 Apr;35(3):377-387. doi: 10.1007/s10571-014-0133-y. Epub 2014 Nov 13. PMID: 25392236.

2. Heier CR, Yu Q, Fiorillo AA, Tully CB, Tucker A, Mazala DA, Uaesoontrachoon K, Srinivassane S, Damsker JM, Hoffman EP, Nagaraju K, Spurney CF. Vamorolone targets dual nuclear receptors to treat inflammation and dystrophic cardiomyopathy. Life Sci Alliance. 2019 Feb 11;2(1):e201800186. doi: 10.26508/lsa.201800186. PMID: 30745312; PMCID: PMC6371196.

7. Bioactivity

Biological target:

Vamorolone (VBP15) is a first-in-class, orally active dissociative steroidal anti-inflammatory drug and membrane-stabilizer.

In vitro activity

VBP15 has protective physicochemical effects on the plasma membrane, protecting cells from injury and promoting membrane repair. This sub-activity is likely to be particularly important in duchenne muscular dystrophy (DMD) where disease pathogenesis is clearly linked to membrane instability and myofibre injury. A key anti-inflammatory activity, the inhibition of TNFα-induced NF-κB, is retained by VBP15. This mechanism occurs through protein–protein interactions of the VBP15 ligand-activated GR, independently of DNA binding, GRE activation, or upregulation of inhibitory transcripts. NF-κB activation is among the earliest histological features of DMD neonates (Chen et al, 2005; Porter et al, 2002, 2003), years before symptoms appear.

Reference: EMBO Mol Med. 2013 Oct;5(10):1569-85. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3799580/

In vivo activity

The EAE model shows that VBP15 does, indeed, reduce CNS inflammation to a similar degree to that of prednisolone. VBP15 was able to reduce both the incidence and severity of disease which was assessed based on the degree of paralysis. This anti-inflammatory effect was confirmed via histological studies which showed a significant reduction of inflammatory foci. It was found that that a 5-week treatment regimen of VBP15 did not decrease trabecular thickness in mdx mouse model of Duchenne Muscular Dystrophy (Heier et al. 2013). With regard to muscle atrophy, it was determined that a 5 week treatment with prednisolone significantly upregulated expression of MurF1 and FBXO32, two genes known to play a key role in GC-mediated muscle catabolism, whereas VBP15 did not. Additionally, the weight of the diaphragms in prednisolone-treated mice was significantly less than that of VBP15-treated mice, providing further evidence that VBP15 may not induce the muscle-wasting processes associated with long-term glucocorticoid use.

Reference: Cell Mol Neurobiol. 2015 Apr;35(3):377-387. https://link-springer-com.libproxy.lib.unc.edu/article/10.1007/s10571-014-0133-y