Small Molecules

R848

Immune modulator; TLR7 and TLR8 agonist

Catalog #	73782	10 mg
	73784	50 mg

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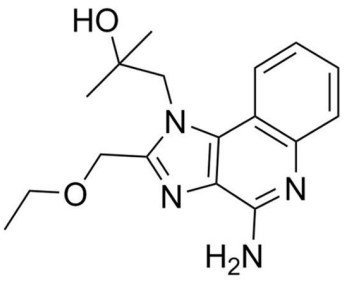
Product Description

R848 is an imidazoquinoline and agonist of Toll-like receptors (TLRs) 7 and 8. It mimics the pathogen-associated molecular patterns that activate immune cells through TLR7 and TLR8, and thereby acts as an immune-response modifier. It demonstrates potent anti-tumor and anti-viral properties (IC_{50} = 4.2 µM; Seganish et al.), which appear to be mediated predominantly through the induction of cytokines, including interferon (IFN)-α and interleukin (IL)-12 due to stimulation of monocytes, macrophages, and dendritic cells (Bernstein et al.; Hattermann et al.; Nian et al.).

Molecular Name:	R848
Alternative Names:	Resiquimod; S 28463
CAS Number:	144875-48-9
Chemical Formula:	$C_{17}H_{22}N_4O_2$
Molecular Weight:	314.4 g/mol
Purity:	≥ 98%
Chemical Name:	4-amino-2-(ethoxymethyl)-a,a-dimethyl-1H-imidazo[4,5-c]quinoline-1-ethanol
Structure:	

Properties

Physical Appearance:	A crystalline solid
Storage:	Product stable at -20°C as supplied. Protect product from prolonged exposure to light. For long-term storage store with a desiccant. Stable as supplied for 12 months from date of receipt.
Solubility:	· DMSO ≤ 35 mM · Absolute ethanol ≤ 10 mM For example, to prepare a 10 mM stock solution in DMSO, resuspend 10 mg in 3.18 mL of DMSO. Prepare stock solution fresh before use. Information regarding stability of small molecules in solution has rarely been reported, however, as a general guide we recommend storage in DMSO at -20°C. Aliquot into working volumes to avoid repeated freeze-thaw cycles. The effect of storage of stock solution on compound performance should be tested for each application. Compound has low solubility in aqueous media. For use as a cell culture supplement, stock solution should be diluted into culture medium immediately before use. Avoid final DMSO concentration above 0.1% due to potential cell toxicity.

Published Applications

IMMUNOLOGY
· Triggers activation of human B cells, including activation of c-Jun kinase, p38, and NF-κB transcription factors (Bishop et al.).
· Induces proliferation and cytokine production by human CD4+ T cells (Caron et al.).
· Primes human neutrophils for leukotriene B4, prostaglandin E2, and platelet-activating factor biosynthesis (Hattermann et al.).
· Suppresses HIV-1 replication in monocytes (Nian et al.).
· Induces expression of IL-12 and IFN-γ in mouse and human peripheral blood cell cultures (Wagner et al.).
DIFFERENTIATION
· Targets osteoclast precursors and inhibits their differentiation into osteoclasts via TLR7 (Miyamoto et al.).
· Induces myeloid differentiation of CD34+ hematopoietic progenitor cells, including upregulated expression of cytokines (IL-1β, TNF-α, IL-6, and GM-CSF) and CD11c surface marker (Sioud et al.).

References

Bernstein DI et al. (2001) Daily or weekly therapy with resiquimod (R-848) reduces genital recurrences in herpes simplex virus-infected guinea pigs during and after treatment. J Infect Dis 183(6): 844–9.
Bishop GA et al. (2000) Molecular mechanisms of B lymphocyte activation by the immune response modifier R-848. J Immunol 165(10): 5552–7.
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Hattermann K et al. (2007) The Toll-like receptor 7/8-ligand resiquimod (R-848) primes human neutrophils for leukotriene B4, prostaglandin E2 and platelet-activating factor biosynthesis. FASEB J 21(7): 1575–85.
Miyamoto A et al. (2012) R848, a Toll-like receptor 7 agonist, inhibits osteoclast differentiation but not survival or bone-resorbing function of mature osteoclasts. Cytotechnology 64(3): 331–9.
Nian H et al. (2012) R-848 triggers the expression of TLR7/8 and suppresses HIV replication in monocytes. BMC Infect Dis 12: 5.
Seganish WM et al. (2015) Discovery and structure enabled synthesis of 2,6-diaminopyrimidin-4-one IRAK4 inhibitors. ACS Med Chem Lett 6(8): 942–7.
Sioud M et al. (2006) Signaling through Toll-like receptor 7/8 induces the differentiation of human bone marrow CD34+ progenitor cells along the myeloid lineage. J Mol Biol 364(5): 945–54.
Wagner TL et al. (1999) Modulation of TH1 and TH2 cytokine production with the immune response modifiers, R-848 and imiquimod. Cell Immunol 191(1): 10–9.

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