Small Molecules

R848

Immune modulator; TLR7 and TLR8 agonist

Catalog # 73782	10 mg
73784	50 mg

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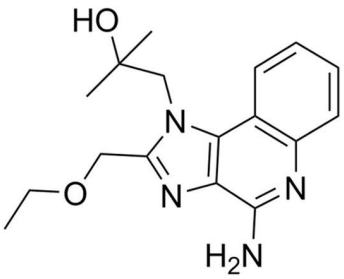
Product Description

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. As a precaution, STEMCELL recommends storing all small molecules away from direct light. For long-term storage, store with a desiccant. Stable as supplied for 12 months from date of receipt.
Solubility:	· DMSO ≤ 95 mM · Absolute ethanol ≤ 45 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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