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产品名称：Tamibarotene
产品别名：他米巴罗汀；Am 80

生物活性：	
Description	Tamibarotene is a retinoic acid receptor α/β (RARα/β) agonist, showing high selectivity over RARγ.
IC_{50} & Target	RARα/β[1]
In Vitro	Tamibarotene (20, 40 μM) down-regulates expression of cell cycle gene in T-cell lymphoma cells. Tamibarotene (5 μM) increases RARE activity in RARA-overexpressing cells to a much greater degree than in RARAlow cells. Moreover, RARAwt overexpression augments the degree of CDK2, CDK4, and CDK6 inhibition caused by Tamibarotene treatment[1]. Tamibarotene directly reverses the profibrotic phenotype of transforming growth factor-β1-treated dermal fibroblasts, suppresses ICAM-1 expression in endothelial cells, and promots M1 macrophage differentiation in vitro[2]. Tamibarotene (4 μM) up-regulates apelin mRNA and protein levels dose-dependently in VSMCs. Upon Tamibarotene stimulation, the RARα (retinoic acid receptor α) is recruited to the apelin promoter by interacting with KLF5 and Sp1 prebound to the TCE site of the apelin promoter to form a transcriptional activation complex, subsequently leading to the up-regulation of apelin expression in VSMCs. KLF5 and Sp1 co-operatively mediate Tamibarotene-induced apelin expression through their direct binding to the TCE on the apelin promoter[4].
In Vivo	Tamibarotene (1 mg/kg/day) significantly attenuates dermal and hypodermal fibrosis in bleomycin (BLM)-treated mice and tight skin 1 mice, respectively. Consistently, Tamibarotene significantly suppresses the expression of various molecules related to tissue fibrosis, including transforming growth factor-β1, connective tissue growth factor, IL-4, IL-10, IL-13, IL-17A, tumor necrosis factor-α, IFN-γ, and monocyte chemotactic protein 1 in the lesional skin of BLM-treated mice. Furthermore, Tamibarotene decreases the proportion of effector T cells, while increasing that of naive T cells among $CD4^+$ T cells in the draining lymph nodes of BLM-treated mice[2]. Tamibarotene (2.5 mg/kg, p.o.) does not result in any significant alteration of the AST, ALT, or ALP serum levels in periodontitis-challenged mice compared with that in untreated mice. Tamibarotene ameliorates alveolar bone resorption, significantly reduces the number of *P. gingivalis*-induced osteoclasts in mice. Tamibarotene measurably increases the percentage of $CD4^+$ $Foxp3^+$ Treg cells as compared to those in EPD mice. Tamibarotene is also effective in reducing the expression of $CD4^+ROR\text{-}\gamma t^+$ (Th17) cells in *P. gingivalis*-infected gingival tissues and CLNs[3]. Tamibarotene (1 mg/kg, p.o.) increases apelin expression in balloon-injured arteries of rats, consistent with the results from the cultured VSMCs[4]. In aged SAMP8 mice, hippocampal ADAM10 levels improve after Tamibarotene (1 mg/kg/day) administration. Hes5 and Ki67 are restored and spatial working memory also improves after Tamibarotene administration[5].

In Vitro:

DMSO : 25.5 mg/mL (72.56 mM; Need ultrasonic and warming)

	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
Preparing Stock Solutions	1 mM	2.8454 mL	14.2272 mL	28.4544 mL
	5 mM	0.5691 mL	2.8454 mL	5.6909 mL
	10 mM	0.2845 mL	1.4227 mL	2.8454 mL

*请根据产品在不同溶剂中的溶解度选择合适的溶剂配制储备液；一旦配成溶液，请分装保存，避免反

Solvent&Solubility	复冻融造成的产品失效。 储备液的保存方式和期限：-80°C, 6 months; -20°C, 1 month。 -80°C 储存时，请在 6 个月内使用，-20°C 储存时，请在 1 个月内使用。 ***In Vivo:*** 请根据您的实验动物和给药方式选择适当的溶解方案。以下溶解方案都请先按照 In Vitro 方式配制澄清的储备液，再依次添加助溶剂： ——为保证实验结果的可靠性，澄清的储备液可以根据储存条件，适当保存；体内实验的工作液，建议您现用现配，当天使用； 以下溶剂前显示的百分比是指该溶剂在您配制终溶液中的体积占比；如在配制过程中出现沉淀、析出现象，可以通过加热和/或超声的方式助溶 1.请依序添加每种溶剂： 10% DMSO→40% PEG300 →5% Tween-80 → 45% saline Solubility: ≥ 2.5 mg/mL (7.11 mM); Clear solution 此方案可获得 ≥ 2.5 mg/mL (7.11 mM，饱和度未知) 的澄清溶液。 以 1 mL 工作液为例，取 100 μL 25.0 mg/mL 的澄清 DMSO 储备液加到 400 μL PEG300 中，混合均匀；向上述体系中加入 50 μL Tween-80，混合均匀；然后继续加入 450 μL 生理盐水定容至 1 mL。 2.请依序添加每种溶剂： 10% DMSO→ 90% (20% SBE-β-CD in saline) Solubility: ≥ 2.5 mg/mL (7.11 mM); Clear solution 此方案可获得 ≥ 2.5 mg/mL (7.11 mM，饱和度未知) 的澄清溶液。 以 1 mL 工作液为例，取 100 μL 25.0 mg/mL 的澄清 DMSO 储备液加到 900 μL 20% 的 SBE-β-CD 生理盐水水溶液中，混合均匀。 3.请依序添加每种溶剂： 10% DMSO →90% corn oil Solubility: ≥ 2.5 mg/mL (7.11 mM); Clear solution 此方案可获得 ≥ 2.5 mg/mL (7.11 mM，饱和度未知) 的澄清溶液，此方案不适用于实验周期在半个月以上的实验。 以 1 mL 工作液为例，取 100 μL 25.0 mg/mL 的澄清 DMSO 储备液加到 900 μL 玉米油中，混合均匀。
References	[1]. Wang X, et al. Retinoic acid receptor alpha drives cell cycle progression and is associated with increased sensitivity to retinoids in T-cell lymphoma. Oncotarget. 2017 Apr 18;8(16):26245-26255. [2]. Toyama T, et al. Tamibarotene Ameliorates Bleomycin-Induced Dermal Fibrosis by Modulating Phenotypes of Fibroblasts, Endothelial Cells, and Immune Cells. J Invest Dermatol. 2016 Feb;136(2):387-98. [3]. Jin Y, et al. Tamibarotene modulates the local immune response in experimental periodontitis. Int Immunopharmacol. 2014 Dec;23(2):537-45. [4]. Lv XR, et al. Synthetic retinoid Am80 up-regulates apelin expression by promoting interaction of RARα with KLF5 and Sp1 in vascular smooth muscle cells. Biochem J. 2013 Nov 15;456(1):35-46. [5]. Kitaoka K, et al. The retinoic acid receptor agonist Am80 increases hippocampal ADAM10 in aged SAMP8 mice. Neuropharmacology. 2013 Sep;72:58-65.
实验参考：	
	The CellTiter Aqueous Non-Radioactive Cell Proliferation Assay Kit is used to assess cell growth. Briefly, 10,000 cells per well are seeded in a 96-well plate and cultured in RPMI containing 2%

Cell Assay	charcoal-stripped FBS and indicated retinoid concentrations for 72 hours. At the end of the treatment period, the MTS reagent is added, cells are incubated an additional 2-4 hours, and absorbance is measured at 490 nanometers. [1]
Animal Administration	For the infection, mice are given sulfamethoxazole and trimethoprim in an oral suspension at 10 mL of deionized water ad libitum for 10 days to reduce the native flora and to support colonization of P. gingivalis W83. Four days after the antibiotic therapy finishes, periodontal infection is established through oral inoculation using 1010 colony-forming units of P. gingivalis suspended in 100 μL 4% carboxymethyl cellulose (CMC) for 7 days. The mice are euthanized 4 weeks after the first oral inoculation. Tamibarotene (2.5 mg/kg) is suspended in a 0.5% carboxymethyl cellulose solution. The drug is orally gavaged into the esophagus daily in a volume of 0.1 mL/10 g body weight. Tamibarotene is administered 1 h before the induction of periodontitis and then given daily per the protocol until day 28. Control mice with periodontal disease receive the same volume of 0.5% carboxymethyl cellulose solution. The body weight of each mouse is measured every 3 days. [3]
References	[1]. Wang X, et al. Retinoic acid receptor alpha drives cell cycle progression and is associated with increased sensitivity to retinoids in T-cell lymphoma. Oncotarget. 2017 Apr 18;8(16):26245-26255. [2]. Toyama T, et al. Tamibarotene Ameliorates Bleomycin-Induced Dermal Fibrosis by Modulating Phenotypes of Fibroblasts, Endothelial Cells, and Immune Cells. J Invest Dermatol. 2016 Feb;136(2):387-98. [3]. Jin Y, et al. Tamibarotene modulates the local immune response in experimental periodontitis. Int Immunopharmacol. 2014 Dec;23(2):537-45. [4]. Lv XR, et al. Synthetic retinoid Am80 up-regulates apelin expression by promoting interaction of RARα with KLF5 and Sp1 in vascular smooth muscle cells. Biochem J. 2013 Nov 15;456(1):35-46. [5]. Kitaoka K, et al. The retinoic acid receptor agonist Am80 increases hippocampal ADAM10 in aged SAMP8 mice. Neuropharmacology. 2013 Sep;72:58-65.