# 产品名称：Odanacatib (MK-0822)
# 产品别名：奥当卡替

## 生物活性：

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| **Description** | Odanacatib (MK-0822) is a potent and selective inhibitor of cathepsin K, with an $IC_{50}$ of 0.2 nM for human cathepsin K. |
| **$IC_{50}$ & Target** | IC50: 0.2 nM (Human Cathepsin K), 1 nM (Rabbit Cathepsin K) |
| **In Vitro** | Odanacatib is a weak inhibitor of antigen presentation, measured in a mouse B cell line (IC50=1.5±0.4 μM), compared to the Cat S inhibitor LHVS (IC50=0.001 μM) in the same assay. Odanacatib also shows weak inhibition of the processing of the MHC II invariant chain protein Iip10 in mouse splenocytes compared to LHVS (minimum inhibitory concentration 1-10 μM versus 0.01 μM, respectively)[1]. Odanacatib reduces resorption activity as measured by CTx release (IC50=9.4 nM) or resorption area (IC50=6.5 nM), but has no impact on OC activation. Odanacatib dose-dependently reduces CTx release with an IC50=9.4±1.0 nM. Odanacatib treated OC accumulates labeled degraded bone matrix proteins in CatK containing vesicles[2]. |
| **In Vivo** | Odanacatib (30 mg/kg, orally, once daily) persistently suppresses bone resorption markers and serum bone formation markers versus vehicle-treated OVX monkeys. Odanacatib displays compartment-specific effects on trabecular versus cortical bone formation, with treatment resulting in marked increases in periosteal bone formation and cortical thickness in ovariectomized monkeys whereas trabecular bone formation is reduced[3]. The bone volume/total volume (BV/TV) and bone mineral density (BMD) of the OVX + ODN-h group is significantly higher than that of the OVX + Veh group ($p < 0.05$). The expressions of Runx2, Collagen-1, BSP, Osterix, OPN and SPP1 are significantly lower in the OVX + ODN-h group than in the OVX + Veh group ($p < 0.01$). Compared with the OVX + Veh group, the expressions of Collagen-I, BSP, Osterix, OPN and ALP reduce in the OVX + ODN-I group, but are upregulated in the OVX + ODN-h group[4]. |
| **Solvent&Solubility** | ***In Vitro:***<br>**DMSO : ≥ 25 mg/mL (47.57 mM)**<br>* "≥" means soluble, but saturation unknown. |

**Preparing Stock Solutions**

| Solvent / Mass / Concentration | 1 mg | 5 mg | 10 mg |
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| 1 mM | 1.9027 mL | 9.5137 mL | 19.0273 mL |
| 5 mM | 0.3805 mL | 1.9027 mL | 3.8055 mL |
| 10 mM | 0.1903 mL | 0.9514 mL | 1.9027 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 →90% corn oil

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| | Solubility: ≥ 2.5 mg/mL (4.76 mM); Clear solution<br>此方案可获得 ≥ 2.5 mg/mL (4.76 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。<br>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]. Jacques Yves Gauthier, et al. The discovery of odanacatib (MK-0822), a selective inhibitor of cathepsin K. Bioorg Med Chem Lett. 2008 Feb 1;18(3):923-8.<br>[2]. Leung P, et al. The effects of the cathepsin K inhibitor odanacatib on osteoclastic bone resorption and vesicular trafficking. Bone. 2011 Oct;49(4):623-635.<br>[3]. Ng KW. Potential role of odanacatib in the treatment of osteoporosis. Clin Interv Aging. 2012;7:235-47.<br>[4]. Yi C, et al. Inhibition of cathepsin K promotes osseointegration of titanium implants in ovariectomised rats. Sci Rep. 2017 Mar 17;7:44682. |

**实验参考：**

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| **Cell Assay** | To assess cell survival, differentiated osteoclast (OC) at appr $7\times10^4$ cells/cm$^2$ are re-seeded on bovine bone slices with or without 100 nM Odanacatib (ODN). Bone slices are fixed on days 2, 4, 6, and 12 with no media changes. Samples are stained for TRAP activity, and OC number.［2］ |
| **Animal Administration** | Sixteen, 8-month-old, female Sprague-Dawley (SD) rats (weight, 385 ± 55 g) are given water and soft diet food ad libitum in a temperature-controlled environment with regular 12-h cycles of light and dark. The rats are randomised into 4 groups, with 4 rats in each group: sham group, OVX + Veh group, OVX + ODN-l group and OVX + ODN-h group. Following implant insertion, Odanacatib (ODN, 5 mg/mL) is administered to the OVX + ODN-l and OVX + ODN-h groups at concentrations of 1 mL/kg and 6 mL/kg, respectively, by gavaging once a day for 8 weeks. The OVX + Veh group is gavaged with 0.5% sodium carboxymethyl cellulose at a concentration of 6 mL/kg over the same duration. After the gavage administration, the rats of each group are sacrificed by injecting sodium pentobarbital intravenously. The implants are harvested and fixed in 10% buffered formalin together with the surrounding bone. [4] |
| **References** | [1]. Jacques Yves Gauthier, et al. The discovery of odanacatib (MK-0822), a selective inhibitor of cathepsin K. Bioorg Med Chem Lett. 2008 Feb 1;18(3):923-8.<br>[2]. Leung P, et al. The effects of the cathepsin K inhibitor odanacatib on osteoclastic bone resorption and vesicular trafficking. Bone. 2011 Oct;49(4):623-635.<br>[3]. Ng KW. Potential role of odanacatib in the treatment of osteoporosis. Clin Interv Aging. 2012;7:235-47.<br>[4]. Yi C, et al. Inhibition of cathepsin K promotes osseointegration of titanium implants in ovariectomised rats. Sci Rep. 2017 Mar 17;7:44682. |