Odanacatib (MK 0822) is a potent, selective, and neutral inhibitor of human and rabbit cathepsin K with IC50 of 0.2 nM and 1 nM, respectively. In vitro, Odanacatib shows the high inhibitory activity and selectivity on cathepsin K with IC50 values of 0.2 nM and 1 nM for human cathepsin K and rabbit cathepsin K, respectively. Furthermore, Odanacatib also shows similar potencies in whole human cell enzyme occupancy assays with corrected IC50 of 6 nM. A recent study shows that Odanacatib results in reduction of Osteoclast (OC) resorption activity by interrupting intracellular vesicular trafficking. In preclinical rats, Odanacatib (10 mg/kg) exhibits excellent pharmacokinetics with clearance (Cl: 2 mL kg⁻¹ min⁻¹), low volume of distribution (V₅₀: 1.1 L kg⁻¹), half-life (T₁/₂: 6 hours) and oral bioavailability (F: 8%), respectively. Besides, Odanacatib also exhibits excellent metabolic stability in rat hepatocytes with a 96% recovery of the parent identity. Odanacatib (ODN) administrated by p.o. prevents bone loss in ovariectomized (OVX) rabbits in a dose-related manner. Moreover, Odanacatib (9 µM/day) leads to a significant increase in proximal femur bone mineral density (BMD) (7.8%), femoral neck BMD (10.8%) and the greater trochanter BMD (6.5%). In the estrogen-deficient, skeletally mature rhesus monkeys, long-term treatment with Odanacatib effectively inhibits bone turnover without reducing osteoclast number and maintains normal biomechanical properties of the spine of O VX nonhuman primates. Odanacatib (MK 0822) is currently in Phase I clinical trials in patients with Osteoporosis. Combination of Odanacatib (MK 0822), cholecalciferol and calcium carbonate is currently in Phase II clinical trials in patients with Osteoporosis Postmenopausal.

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**Technical Data**

<table>
<thead>
<tr>
<th>Molecular Weight (MW)</th>
<th>Solubility (25°C)</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>525.58</td>
<td>DMDS 105 mg/mL</td>
<td>2 years -20°C Powder</td>
</tr>
<tr>
<td></td>
<td>Water &lt;1 mg/mL</td>
<td>2 weeks 4°C in DMDS</td>
</tr>
<tr>
<td></td>
<td>Ethanol 3 mg/mL</td>
<td>6 months -80°C in DMDS</td>
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</tbody>
</table>

**Biological Activity**

<table>
<thead>
<tr>
<th>Description</th>
<th>Targets</th>
<th>IC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odanacatib (MK 0822)</td>
<td>Human Cathepsin K, Rabbit Cathepsin K</td>
<td>0.2 nM</td>
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</tbody>
</table>

**Protocol** (Only for Reference)

**Animal Study**[3]

<table>
<thead>
<tr>
<th>Animal Models</th>
<th>Formulation</th>
<th>Doses</th>
<th>Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ovariectomized (OVX) rabbit model</td>
<td>Odanacatib is provided in a diet formulae.</td>
<td>≤9 µM/day</td>
<td>Administered via p.o.</td>
</tr>
</tbody>
</table>

References:


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**Toll Free:**
(877) 796-6397
-- USA and Canada only --

**Fax:**
+1-713-796-9816

**Orders:**
+1-832-582-8158
sales@selleckchem.com

**Tech Support:**
+1-832-582-8158
Ext3
Monday-Friday
9:00 AM-5:00 PM (Central Time)
tech@selleckchem.com
We will contact you within one business day

**Website:**
www.selleckchem.com