D-Galactose

Cat. No.: HY-N0210
CAS No.: 59-23-4
Molecular Formula: C₆H₁₂O₆
Molecular Weight: 180.16
Target: Endogenous Metabolite
Pathway: Metabolic Enzyme/Protease
Storage:
- Powder -20°C 3 years
  4°C 2 years
- In solvent -80°C 6 months
  -20°C 1 month

SOLVENT & SOLUBILITY

In Vitro

**H₂O:** $\geq 100$ mg/mL ($55.06$ mM)

*“≥” means soluble, but saturation unknown.*

<table>
<thead>
<tr>
<th>Preparing Stock Solutions</th>
<th>Solvent Mass</th>
<th>1 mg</th>
<th>5 mg</th>
<th>10 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mM</td>
<td>5.5506 mL</td>
<td>27.7531 mL</td>
<td>55.5062 mL</td>
<td></td>
</tr>
<tr>
<td>5 mM</td>
<td>1.1101 mL</td>
<td>5.5506 mL</td>
<td>11.1012 mL</td>
<td></td>
</tr>
<tr>
<td>10 mM</td>
<td>0.5551 mL</td>
<td>2.7753 mL</td>
<td>5.5506 mL</td>
<td></td>
</tr>
</tbody>
</table>

Please refer to the solubility information to select the appropriate solvent.

BIOLOGICAL ACTIVITY

Description
D-Galactose is a natural aldohexose and C-4 epimer of glucose.

IC₅₀ & Target
Human Endogenous Metabolite

In Vitro
Galactose is important for the survival and virulence of bacteria. In Escherichia coli galactose is utilized by the Leloir pathway. Two anomers of d-galactose are used for different purposes, α-d-galactose as a carbon source and β-d-galactose for induction of UDP-galactose synthesis for biosynthetic glycosylation[1].

In Vivo
Chronic D-galactose exposure induces neurodegeneration by enhancing caspase-mediated apoptosis and inhibiting neurogenesis and neuron migration in mice, as well as increasing oxidative damage. In addition, D-galactose-induced toxicity in mice is a useful model for studying the mechanisms of neurodegeneration and neuroprotective drugs and agents[2]. D-galactose given by oral route causes cognitive impairments in rats which are accompanied by oxidative damage. Cognitive impairments is observed in the open-field test in the 4th and 6th weeks after d-gal administration,
as well as an impairment in spatial memory in the radial maze test after the 6th week of d-gal administration[3].

**PROTOCOL**

**Animal Administration** [2][3]

Rats: D-galactose is dissolved in water for administration at the dose of 100 mg/kg of body weight, and given by oral gavage, once a day, over a period of 1, 2, 4, 6 or 8 weeks. Animals are randomized into two groups: control animals (receiving water by oral gavage) or d-gal animals (receiving D-galactose by oral gavage). The behavioral tests and biochemical analysis are undertaken on the 1st, 2nd, 4th, 6th and 8th weeks after the last administration of d-gal[3].

Mice: Male adult C57BL/6 mice are randomly divided into three groups (control, D-galactose, and D-galactose plus α-LA). D-galactose (100 mg/kg) is injected subcutaneously (s.c.) daily into mice for 7 weeks. α-LA (100 mg/kg body weight) is injected peritoneally (i.p.) daily concomitantly for 7 weeks. All control animals are given saline[2].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

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**REFERENCES**

