Guanylate Cyclase

Guanylate cyclase (guanylyl cyclase, GC) is a lyase enzyme. Guanylyl cyclase is often part of the G protein signaling cascade that is activated by low intracellular calcium levels and inhibited by high intracellular calcium levels. In response to calcium levels, guanylyl cyclase synthesizes cGMP from GTP. cGMP keeps cGMP-gated channels open, allowing for the entry of calcium into the cell. The guanylyl cyclase activity is modulated by the calcium-binding guanylyl cyclase activating proteins (GCAP1 and GCAP2). A key mechanism by which Ca\(^{2+}\) modulates phototransduction in rods involves the synthesis of cGMP by guanylyl cyclase (GC), regulated by a pair of Ca\(^{2+}\)-binding GuanylylCyclase Activating Proteins (GCAP1 and GCAP2).

The second messenger cyclic guanosine monophosphate (cGMP) is generated by the heterodimeric α/β-heme protein soluble guanylate cyclase (sGC) upon activation by its endogenous ligand nitric oxide (NO). NO binds to the reduced prosthetic heme group bound to the β subunit. cGMP is a key mediator of the cardiovascular system and its effects lead to vasodilation, inhibition of smooth muscle proliferation, blockade of leukocyte infiltration and inhibition of platelet aggregation. Impairment of the cytoprotective NO/sGC/cGMP-signalling pathway is associated with the development of serious cardiovascular diseases such as hypertension or heart failure.
Guanylate Cyclase Inhibitors & Modulators

(4-Acetamidocyclohexyl) nitrate
(BM121307)  
Cat. No.: HY-100295

Bioactivity: BM121307 is a guanylate cyclase activator that was in phase I development for the treatment of ischaemic heart disorders. The research has been discontinued.

Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg, 10 mg

BAY 41-2272  
Cat. No.: HY-12376

Bioactivity: BAY 41-2272 is a soluble guanylate cyclases (sGC) activator.

Purity: 99.93%
Clinical Data: No Development Reported
Size: 10mM x 1mL in DMSO, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg

Cinaciguat (BAY 58-2667)  
Cat. No.: HY-14181

Bioactivity: Cinaciguat is an activator of guanylate cyclase (sGC), and used for acute decompensated heart failure.

Purity: 99.40%
Clinical Data: Phase 2
Size: 10mM x 1mL in DMSO, 2 mg, 5 mg, 10 mg, 50 mg

Cinaciguat hydrochloride (BAY 58-2667 hydrochloride)  
Cat. No.: HY-14181A

Bioactivity: Cinaciguat hydrochloride is a potent soluble guanylate cyclase (sGC) activator with EC₅₀ of 15 nM in platelets.

Purity: 98.0%
Clinical Data: Phase 2
Size: 10mM x 1mL in DMSO, 2 mg, 5 mg, 10 mg, 50 mg

Lificiguat (YC-1)  
Cat. No.: HY-14927

Bioactivity: Lificiguat binds to the β subunit of soluble guanylyl cyclase (sGC) with Kᵅ of 0.6-1.1 μM in the presence of CO.

Purity: 99.83%
Clinical Data: No Development Reported
Size: 10mM x 1mL in DMSO, 5 mg, 10 mg, 50 mg, 100 mg, 200 mg

Linaclotide  
Cat. No.: HY-17584

Bioactivity: Linaclotide is a potent and selective guanylate cyclase C agonist; developed for the treatment of constipation-predominant irritable bowel syndrome (IBS-C) and chronic constipation.

Purity: 98.46%
Clinical Data: Launched
Size: 10mM x 1mL in DMSO, 5 mg, 10 mg

Nelociguat (BAY60-4552)  
Cat. No.: HY-78237

Bioactivity: Nelociguat (BAY60-4552) is a nitric oxide sensitive soluble guanylate cyclase stimulator.

Purity: 90.0%
Clinical Data: Phase 2
Size: 10mM x 1mL in DMSO, 5 mg, 10 mg, 50 mg, 100 mg, 200 mg, 500 mg, 1 g

Plecanatide acetate  
Cat. No.: HY-108741A

Bioactivity: Plecanatide acetate is a guanylate cyclase-C (GC-C) receptor agonist, with an EC₅₀ of 190 nM in T84 cells. Plecanatide acetate shows anti-inflammatory activity in models of murine colitis [1].

Purity: 99.26%
Clinical Data: No Development Reported
Size: 10mM x 1mL in DMSO, 5 mg, 10 mg

Riociguat (BAY 632521)  
Cat. No.: HY-14779

Bioactivity: Riociguat is an oral stimulator of soluble guanylate cyclase (sGC) used in the treatment of pulmonary hypertension.

Purity: 99.58%
Clinical Data: Launched
Size: 10mM x 1mL in DMSO, 5 mg, 10 mg, 50 mg, 100 mg, 200 mg

sGC activator 1  
Cat. No.: HY-111516

Bioactivity: sGC activator 1 (Compound (+)-23) is a soluble guanylate cyclase (sGC) activator with EC₅₀ of <5 nM, and 5 nM in CHO and GTM-3 E cells, respectively [1].

Purity: >98%
Clinical Data: No Development Reported
Size: No Development Reported

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<table>
<thead>
<tr>
<th><strong>Bioactivity:</strong></th>
<th>Vericiguat (BAY1021189) is a potent, orally available and soluble guanylate cyclase stimulator.</th>
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<tbody>
<tr>
<td><strong>Purity:</strong></td>
<td>98.0%</td>
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<tr>
<td><strong>Clinical Data:</strong></td>
<td>Phase 3</td>
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<tr>
<td><strong>Size:</strong></td>
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