AMPK (AMP-activated protein kinase) is an enzyme that plays a role in cellular energy homeostasis. It consists of three proteins (subunits) that together make a functional enzyme. The net effect of AMPK activation is stimulation of hepatic fatty acid oxidation and ketogenesis, inhibition of cholesterol synthesis, lipogenesis, and triglyceride synthesis, inhibition of adipocyte lipolysis and lipogenesis, stimulation of skeletal muscle fatty acid oxidation and muscle glucose uptake by pancreatic beta-cells. AMPK acts as a metabolic master switch regulating several intracellular systems including the cellular uptake of glucose, the β-oxidation of fatty acids and the biogenesis of glucose transporter 4 (GLUT4) and mitochondria.
AMPK Activators & Inhibitors

3α-Hydroxymogrol
Cat. No.: HY-N6913
3α-Hydroxymogrol is a triterpenoid isolated from Siraitia grosvenorii Swingle, acts as a potent AMPK activator, and enhances AMPK phosphorylation.

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

7-Methoxysiflavone
Cat. No.: HY-N6631
7-Methoxysiflavone is an isoflavone derivative and also an activator of adenosine monophosphate-activated protein kinase (AMPK).

Purity: 99.81%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 100 mg

A-769662
Cat. No.: HY-50662
A-769662 is a potent, reversible AMPK activator with EC$_{50}$ of 0.8 μM.

Purity: 98.97%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 50 mg, 100 mg

AICAR
(Acadesine; AICA Riboside)
Cat. No.: HY-13417
AICAR is a cell-permeable AMP-activated protein kinase (AMPK) activator.

Purity: 99.92%
Clinical Data: Phase 3
Size: 10 mM × 1 mL, 50 mg, 100 mg, 200 mg, 500 mg

AMPK activator 1
Cat. No.: HY-U00292
AMPK activator 1 is an AMPK activator extracted from patent WO2013116491A1, compound No.1-75, has an EC$_{50}$ of <0.1μM.

Purity: >98.0%
Clinical Data: No Development Reported
Size: 1 mg

Amarogentin
Cat. No.: HY-N2447
Amarogentin is a secoiridoid glycoside that is mainly extracted from Swertia and Gentiana roots. Amarogentin exhibits many biological effects, including anti-oxidative, anti-tumour, and anti-diabetic activities.

Purity: 98.96%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg

Bempedoic acid
(ETC-1002; ESP-55016)
Cat. No.: HY-12357
Bempedoic acid (ETC-1002) is an ATP-citrate lyase (ACL) inhibitor. Bempedoic acid (ETC-1002) activates AMPK.

Purity: >98.0%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 50 mg, 100 mg

Chitosan oligosaccharide
(COS)
Cat. No.: HY-112108
Chitosan oligosaccharide (COS) is an oligomer of β-(1,4)-linked D-glucosamine. Chitosan oligosaccharide (COS) activates AMPK and inhibits inflammatory signaling pathways including NF-κB and MAPK pathways.

Purity: >91.0%
Clinical Data: No Development Reported
Size: 10 mg(10 mg × mL in Water), 500 mg, 1 g, 5 g
**Cimiracemoside C**  
(Cimicifugoside M)  
Cat. No.: HY-N6971

Cimiracemoside C is an active component of Cimicifuga racemosa, activates AMPK, has the potential activity against diabetes.

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

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**Demethyleneberberine**  
Cat. No.: HY-N0592

Demethyleneberberine is a natural mitochondria-targeted antioxidant. Demethyleneberberine alleviates mice colitis and inhibits the inflammatory responses by inhibiting NF-κB pathway and regulating the balance of Th cells.

- **Purity:** >98.0%
- **Clinical Data:** No Development Reported
- **Size:** 10 mM × 1 mL, 1 mg, 5 mg, 10 mg

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**Dorsomorphin dihydrochloride**  
(BML-275; Compound C)  
Cat. No.: HY-13418

Dorsomorphin dihydrochloride (BML-275 dihydrochloride; Compound C dihydrochloride) is a selective, cell-permeable, and ATP-competitive AMPK inhibitor, with a Kᵢ of 109 nM. Dorsomorphin dihydrochloride inhibits BMP pathway by targeting the type I receptors ALK2, ALK3, and ALK6.

- **Purity:** 99.91%
- **Clinical Data:** No Development Reported
- **Size:** 10 mM × 1 mL, 5 mg, 10 mg, 50 mg, 100 mg

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**Doxorubcin hydrochloride**  
(Hydroxydaunorubicin)  
Cat. No.: HY-15142

Doxorubcin hydrochloride is a cytotoxic anthracycline antibiotic for the treatment of multiple cancers.

- **Purity:** 99.47%
- **Clinical Data:** Launched
- **Size:** 10 mM × 1 mL, 50 mg, 100 mg, 200 mg, 500 mg, 1 g

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**EX229**  
Cat. No.: HY-112769

EX229, a Benzimidazole derivative, is a potent and allosteric activator of AMPK-activated protein kinase (AMPK), with Kᵢₐ of 0.06 μM, 0.06 μM and 0.51 μM for a1β1γ1, a2β1γ1 and a1β2γ1 in biolayer interferometry, respectively.

- **Purity:** 98.37%
- **Clinical Data:** No Development Reported
- **Size:** 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg

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**Danthon**  
(Dantron; Chrysazin; 1,8-Dihydroxyanthraquinone)  
Cat. No.: HY-B0923

Danthon is a natural product extracted from the traditional Chinese medicine rhubarb. Danthon functions in regulating glucose and lipid metabolism by activating AMPK.

- **Purity:** >98.0%
- **Clinical Data:** Launched
- **Size:** 10 mM × 1 mL, 10 mg, 100 mg

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**Dorsomorphin**  
(BML-275; Compound C)  
Cat. No.: HY-13418A

Dorsomorphin (BML-275; Compound C) is a selective, cell-permeable, and ATP-competitive AMPK inhibitor (Kᵢ=109 nM in the absence of AMP). Dorsomorphin (BML-275) selectively inhibits BMP type I receptors ALK2, ALK3, and ALK6.

- **Purity:** 99.65%
- **Clinical Data:** Phase 1
- **Size:** 5 mg, 10 mg, 50 mg, 100 mg

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**Dorsumorphin dihydrochloride**  
(BML-275 dihydrochloride; Compound C dihydrochloride)  
Cat. No.: HY-13418

Dorsumorphin dihydrochloride (BML-275 dihydrochloride; Compound C dihydrochloride) is a potent and allosteric activator of AMPK, with a Kᵢ of 109 nM. Dorsumorphin dihydrochloride inhibits BMP-2 pathway by targeting the type I receptors ALK2, ALK3, and ALK6.

- **Purity:** >98%  
- **Clinical Data:** Launch
- **Size:** 10 mM × 1 mL, 50 mg, 100 mg, 200 mg, 500 mg, 1 g

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**Euphorbiasteroid**  
Cat. No.: HY-N2032

Euphorbiasteroid is a tricyclic diterpene of Euphorbia lathyris L., inhibits tyrosinase, and increases the phosphorylation of AMPK, with anti-cancer, anti-virus, anti-obesity and multidrug resistance-modulating effect.

- **Purity:** >98%
- **Clinical Data:** No Development Reported
- **Size:** 5 mg, 10 mg, 20 mg

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**Flufenamic acid**  
Cat. No.: HY-B1221

Flufenamic acid is a non-steroidal anti-inflammatory agent, inhibits cyclooxygenase (COX), activates AMPK, and also modulates ion channels, blocking chloride channels and L-type Ca²⁺ channels, modulating non-selective cation channels (NSC), activating K⁺ channels.

- **Purity:** 99.92%
- **Clinical Data:** Launched
- **Size:** 10 mM × 1 mL, 100 mg
<table>
<thead>
<tr>
<th>Compound</th>
<th>Cat. No.</th>
<th>Purity</th>
<th>Clinical Data</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galegine hydrochloride</td>
<td>HY-N0930B</td>
<td>&gt;98%</td>
<td>No Development Reported</td>
<td>1 mg, 5 mg</td>
</tr>
<tr>
<td>Ginkgo C (BN-52022; Ginkgo-C)</td>
<td>HY-N0785</td>
<td>&gt;98.0%</td>
<td>No Development Reported</td>
<td>10 mM × 1 mL, 10 mg, 50 mg</td>
</tr>
<tr>
<td>Gomisin J</td>
<td>HY-N0385</td>
<td>&gt;99.0%</td>
<td>No Development Reported</td>
<td>10 mM × 1 mL, 5 mg, 10 mg</td>
</tr>
<tr>
<td>HTH-01-015</td>
<td>HY-12334</td>
<td>99.19%</td>
<td>No Development Reported</td>
<td>10 mM × 1 mL, 5 mg, 10 mg</td>
</tr>
<tr>
<td>Karanjin</td>
<td>HY-N2534</td>
<td>&gt;98%</td>
<td>No Development Reported</td>
<td>1 mg, 5 mg</td>
</tr>
<tr>
<td>Metformin hydrochloride (1,1-Dimethylbiguanide hydrochloride)</td>
<td>HY-17471A</td>
<td>99.98%</td>
<td>Launched</td>
<td>10 mM × 1 mL, 500 mg, 10 g</td>
</tr>
<tr>
<td>Methyl cinnamate (Methyl 3-phenylpropenoate)</td>
<td>HY-W017212</td>
<td>99.39%</td>
<td>No Development Reported</td>
<td>10 mM × 1 mL, 100 mg</td>
</tr>
<tr>
<td>MK-3903</td>
<td>HY-107988</td>
<td>98.10%</td>
<td>No Development Reported</td>
<td>10 mM × 1 mL, 1 mg, 5 mg, 10 mg</td>
</tr>
</tbody>
</table>

**Galegine hydrochloride**
Galegine hydrochloride, a guanidine derivative, contributes to weight loss in mice. Guanidine hydrochloride is the compound derived from G. officinalis, which gave rise to the biguanides, metformin and phenformin.

**Ginkgo C** (BN-52022; Ginkgo-C)
Ginkgo C is a flavone isolated from Ginkgo biloba leaves, possessing multiple biological functions, such as decreasing platelet aggregation and ameliorating Alzheimer disease.

**Gomisin J**
Gomisin J is a small molecular weight lignan found in Schisandra chinensis and has been demonstrated to have vasodilatory activity.

**HTH-01-015**
HTH-01-015 is a selective NUAK1/ARK5 inhibitor (IC_{50} is 100 nM). HTH-01-015 inhibits NUAK1 with >100-fold higher potency than NUAK2 (IC_{50} of >10 μM).

**Karanjin**
Karanjin is a major active furanoflavonol constituent of Fordia cauliflora. Karanjin induces GLUT4 translocation in skeletal muscle cells by increasing AMPK activity. Karanjin can induce cancer cell death through cell cycle arrest and enhance apoptosis.

**Metformin hydrochloride**
Metformin (hydrochloride) is an FDA approved first-line drug for the treatment of type 2 diabetes. Metformin decreases hepatic glucose production, mostly through a mild and transient inhibition of the mitochondrial respiratory-chain complex 1.

**Methyl cinnamate (Methyl 3-phenylpropenoate)**
Methyl cinnamate (Methyl 3-phenylpropenoate), an active component of Zanthoxylum armatum, is a widely used natural flavor compound. Methyl cinnamate (Methyl 3-phenylpropenoate) possesses antimicrobial activity and is a tyrosinase inhibitor that can prevent food browning.
<table>
<thead>
<tr>
<th><strong>MK8722</strong></th>
<th><strong>Cat. No.: HY-111363</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>MK8722 is a potent and systemic pan-AMPK activator.</td>
<td></td>
</tr>
<tr>
<td>Purity: 98.87%</td>
<td>Clinical Data: No Development Reported</td>
</tr>
<tr>
<td>Size: 10 mM × 1 mL, 5 mg, 10 mg, 50 mg, 100 mg</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>MRT199665</strong></th>
<th><strong>Cat. No.: HY-120877</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>MRT199665 is a potent and ATP-competitive, selective MARK/SIK/AMPK inhibitor with IC₅₀ of 2/2/5/2 nM, 10/10 nM, and 110/12/43 nM for MARK1/MARK2/MARK3/MARK14, AMPKα1/AMPKα2, and SIK1/SIK2/SIK3, respectively.</td>
<td></td>
</tr>
<tr>
<td>Purity: &gt;98%</td>
<td>Clinical Data: No Development Reported</td>
</tr>
<tr>
<td>Size: 1 mg, 5 mg</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Nepodin</strong></th>
<th><strong>Cat. No.: HY-N5018</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nepodin (Musizin) is a quinone oxidoreductase (PINDH2) inhibitor isolate from Rumex crispus. Nepodin (Musizin) stimulates the translocation of GLUT4 to the plasma membrane by activation of AMPK. Nepodin (Musizin) has antidiabetic and antimalarial activities.</td>
<td></td>
</tr>
<tr>
<td>Purity: &gt;98%</td>
<td>Clinical Data: No Development Reported</td>
</tr>
<tr>
<td>Size: 5 mg, 10 mg</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>O-304</strong></th>
<th><strong>Cat. No.: HY-112233</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>O-304 is a first-in-class, orally available pan-AMPK activator, which increases AMPK activity by suppressing the dephosphorylation of pAMPK. O-304 exhibits a great potential as a drug to treat type 2 diabetes (T2D) and associated cardiovascular complications.</td>
<td></td>
</tr>
<tr>
<td>Purity: 99.72%</td>
<td>Clinical Data: No Development Reported</td>
</tr>
<tr>
<td>Size: 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Palmitelaidic Acid</strong></th>
<th><strong>Cat. No.: HY-N2341</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Palmitelaidic Acid (9-trans-Hexadecenoic acid) is the trans isomer of palmitoleic acid. Palmitoleic acid is one of the most abundant fatty acids in serum and tissue.</td>
<td></td>
</tr>
<tr>
<td>Purity: &gt;99.0%</td>
<td>Clinical Data: No Development Reported</td>
</tr>
<tr>
<td>Size: 10 mg (393 mM * 100 μL in Ethanol),</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>PF-06409577</strong></th>
<th><strong>Cat. No.: HY-103683</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>PF-06409577 is a potent and selective allosteric activator of AMPKα1β1γ1 isoform with an EC₅₀ of 7 nM.</td>
<td></td>
</tr>
<tr>
<td>Purity: 98.56%</td>
<td>Clinical Data: Phase 1</td>
</tr>
<tr>
<td>Size: 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Phenformin hydrochloride</strong></th>
<th><strong>Cat. No.: HY-16397A</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenformin hydrochloride is an anti-diabetic drug from the biguanide class, can activate AMPK activity.</td>
<td></td>
</tr>
<tr>
<td>Purity: &gt;98.0%</td>
<td>Clinical Data: Phase 1</td>
</tr>
<tr>
<td>Size: 10 mM × 1 mL, 500 mg, 1 g, 5 g</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Platycodin D</strong></th>
<th><strong>Cat. No.: HY-N1411</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Platycodin D is a saponin isolated from Platycodi Radix, acts as an activator of AMPKα, with anti-obesity property.</td>
<td></td>
</tr>
<tr>
<td>Purity: &gt;98%</td>
<td>Clinical Data: No Development Reported</td>
</tr>
<tr>
<td>Size: 5 mg, 10 mg, 20 mg</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SAMS</strong></th>
<th><strong>Cat. No.: HY-P0136</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>SAMS peptide is a specific substrate for the AMP-activated protein kinase (AMPK).</td>
<td></td>
</tr>
<tr>
<td>Purity: &gt;98%</td>
<td>Clinical Data: No Development Reported</td>
</tr>
<tr>
<td>Size: 1 mg, 5 mg, 10 mg</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>STO-609</strong></th>
<th><strong>Cat. No.: HY-19805</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>STO-609 is a selective and cell-permeable inhibitor of the Ca²⁺/calmodulin-dependent protein kinase kinase (CaM-KK), with Kᵢ values of 80 and 15 ng/mL for recombinant CaM-KKα and CaM-KKβ, respectively.</td>
<td></td>
</tr>
<tr>
<td>Purity: &gt;98.0%</td>
<td>Clinical Data: No Development Reported</td>
</tr>
<tr>
<td>Size: 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg</td>
<td></td>
</tr>
</tbody>
</table>
Urolithin B

Urolithin B is one of the gut microbial metabolites of ellagitannins, and has anti-inflammatory and antioxidant effects.

Purity: 99.86%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 10 mg, 50 mg, 100 mg

WZ4003

WZ4003 is the first potent and highly specific NUAK kinase inhibitor with IC_{50} of 20 nM/100 nM for NUAK1 (ARK5)/NUAK2, without significant inhibition on other 139 kinases.

Purity: 98.14%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 50 mg

Xanthoangelol


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

YLF-466D

YLF-466D is a newly developed AMPK activator, which inhibits platelet aggregation.

Purity: 99.54%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 50 mg, 100 mg

ZLN024

ZLN024 is an AMPK allosteric activator. ZLN024 directly activates recombinant AMPK α1β1γ1, AMPK α2β1γ1, AMPK α1β2γ1 and AMPK α2β2γ1 heterotrimer with EC_{50} of 0.42 µM, 0.95 µM, 1.1 µM and 0.13 µM, respectively.

Purity: >98%
Clinical Data: No Development Reported
Size: 5 mg, 10 mg, 50 mg

ZLN024 hydrochloride

ZLN024 hydrochloride is an AMPK allosteric activator. ZLN024 directly activates recombinant AMPK α1β1γ1, AMPK α2β1γ1, AMPK α1β2γ1 and AMPK α2β2γ1 heterotrimer with EC_{50} of 0.42 µM, 0.95 µM, 1.1 µM and 0.13 µM, respectively.

Purity: 98.55%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 50 mg

[6]-Gingerol

[6]-Gingerol is an active compound isolated from Ginger (Zingiber officinale Rosc), exhibits a variety of biological activities including anticancer, anti-inflammation, and anti-oxidation.

Purity: 99.54%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg