Aldehyde Dehydrogenase (ALDH)

Aldehyde dehydrogenase 1 (ALDH1), which is a putative marker of breast cancer stem cells (CSCs), in triple negative breast cancer (TNBC) tissues.

Mitochondrial aldehyde dehydrogenase (ALDH2) is a member of the 19-strong human aldehyde dehydrogenase family of NADP⁺-dependent enzymes.

ALDH2, a mitochondrial enzyme responsible for metabolizing the major lipid peroxidation product, protects against acute ischemia/reperfusion injury and chronic heart failure. Activation of ALDH2, the main enzyme that catalyzes 4-HNE metabolism, is sufficient to protect the heart against acute ischemia-reperfusion injury.

ALDH2 is a key detoxifying enzyme. ALDH2 is most commonly associated with its role in ethanol metabolism, catalyzing the oxidation of ethanol-derived acetaldehyde to acetate.
### Aldehyde Dehydrogenase (ALDH) Inhibitors & Agonists

<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>4-Hydroxynonenal (4-HNE)</td>
<td>HY-113466</td>
<td>&gt;95.0%</td>
<td>No Development Reported</td>
<td>10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg</td>
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<tr>
<td>CVT-10216</td>
<td>HY-19801</td>
<td>&gt;98%</td>
<td>No Development Reported</td>
<td>10 mM × 1 mL, 5 mg, 10 mg</td>
</tr>
<tr>
<td>EN40</td>
<td>HY-122577</td>
<td>&gt;98%</td>
<td>No Development Reported</td>
<td>10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg</td>
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<tr>
<td>NCT-501</td>
<td>HY-18768</td>
<td>99.78%</td>
<td>No Development Reported</td>
<td>10 mM × 1 mL, 5 mg, 10 mg, 50 mg, 100 mg</td>
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<tr>
<td>NCT-505</td>
<td>HY-112277</td>
<td>&gt;98%</td>
<td>No Development Reported</td>
<td>100 mg, 250 mg, 500 mg</td>
</tr>
<tr>
<td>RV01</td>
<td>HY-126241</td>
<td>98.00%</td>
<td>No Development Reported</td>
<td>10 mM × 1 mL, 5 mg, 10 mg, 50 mg, 100 mg</td>
</tr>
</tbody>
</table>

**Aldehyde Dehydrogenase (ALDH) Inhibitors & Agonists**

#### 4-Hydroxynonenal (4-HNE)

4-Hydroxynonenal (4-HNE) is an α,β unsaturated hydroxyalkenal and an oxidative/nitrosative stress biomarker. 4-Hydroxynonenal is a substrate and an inhibitor of *acetaldehyde dehydrogenase 2 (ALDH2)*.

**Purity:** >95.0%

**Clinical Data:** No Development Reported

**Size:** 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg

#### Alda-1

Alda-1 is a potent ALDH2 agonist, which activates wild-type ALDH2 and restores near wild-type activity to ALDH2*2.

**Purity:** 99.81%

**Clinical Data:** No Development Reported

**Size:** 10 mM × 1 mL, 5 mg, 10 mg, 50 mg, 100 mg

#### CVT-10216

CVT-10216 is a highly selective, reversible aldehyde dehydrogenase-2 (ALDH-2) inhibitor with an IC<sub>50</sub> of 29 nM. CVT-10216 also has inhibitory effect of ALDH-1 with an IC<sub>50</sub> of 1.3 μM.

**Purity:** >98%

**Clinical Data:** No Development Reported

**Size:** 10 mM × 1 mL, 5 mg, 10 mg

#### Disulfiram (Tetraethylthiuram disulfide; TETD)

Disulfiram (Tetraethylthiuram disulfide) is a specific inhibitor of aldehyde dehydrogenase, used for the treatment of chronic (ALDH1) alcoholism by producing an acute sensitivity to alcohol.

**Purity:** 98.67%

**Clinical Data:** Launched

**Size:** 10 mM × 1 mL, 500 mg, 1 g, 5 g

#### EN40

EN40 is a potent, selective aldehyde dehydrogenase 3A1 (ALDH3A1) inhibitor as a covalent ligand, exhibits an IC<sub>50</sub> value of 2 μM.

**Purity:** >98%

**Clinical Data:** No Development Reported

**Size:** 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg

#### NCT-501

NCT-501 is a potent and selective theophylline-based inhibitor of aldehyde dehydrogenase 1A1 (ALDH1A1), inhibits hALDH1A1 with an IC<sub>50</sub> of 40 nM, typically shows better selectivity over other ALDH isozymes and other dehydrogenases (hALDH1B1, hALDH3A1, and...)

**Purity:** 99.78%

**Clinical Data:** No Development Reported

**Size:** 10 mM × 1 mL, 5 mg, 10 mg, 50 mg, 100 mg

#### NCT-505

NCT-505 is a potent and selective aldehyde dehydrogenase (ALDH1A1) inhibitor, with an IC<sub>50</sub> of 7 nM, and weakly inhibits hALDH1A2, hALDH1A3, hALDH2, hALDH3A1 (IC<sub>50</sub>: >57, 22.8, 20.1, >57 μM).

**Purity:** >98%

**Clinical Data:** No Development Reported

**Size:** 100 mg, 250 mg, 500 mg

#### NCT-506

NCT-506 is an orally bioavailable aldehyde dehydrogenase 1A1 (ALDH1A1) inhibitors with an IC<sub>50</sub> of 7 nM.

**Purity:** >98%

**Clinical Data:** No Development Reported

**Size:** 100 mg, 250 mg, 500 mg

#### RV01

RV01 is an analogue of resveratrol, inhibits DNA damage, reduces *acetaldehyde dehydrogenase 2 (ALDH2)* mRNA expression induced by ethanol, and exhibits hydroxyl radical scavenging activity. RV01 decreases iNOS expression, with anti-neuroinflammatory activity.

**Purity:** 98.00%

**Clinical Data:** No Development Reported

**Size:** 10 mM × 1 mL, 5 mg, 10 mg, 50 mg, 100 mg

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