

# Terpenes



Hemiterpenes

Acyclic Monoterpenes

Monocyclic Monoterpenes

Bicyclic Monoterpenes

Sesquiterpenes

Diterpenes

Triterpenes

Other Terpenes

# Terpenes

Terpenes are a large family of natural products and are known to be the primary constituents of essential oils. They are biosynthesized via the mevalonate pathway. The basic structure is derived from five-carbon isoprene units<sup>1,2)</sup> which are linked together in a head-to-tail fashion to form linear chains or rings. They can be classified on the basis of the length of the carbon chains as illustrated below.

Table 1. Classification of Terpenes and Examples

Name	Number of Carbons	Examples
Hemiterpenes	5	Isoprene
Monoterpenes	10	Menthol, Geraniol: Flavors, Food Additives
Sesquiterpenes	15	Artemisinin: Antimalarial Drug $\alpha$ -Bisabolol: Flavor, Cosmetic Ingredients
Diterpenes	20	Paclitaxel: Antitumor Agent, Gibberellins: Plant Hormones
Triterpenes	30	Lanosterol: Precursor of Steroid Biosynthesis

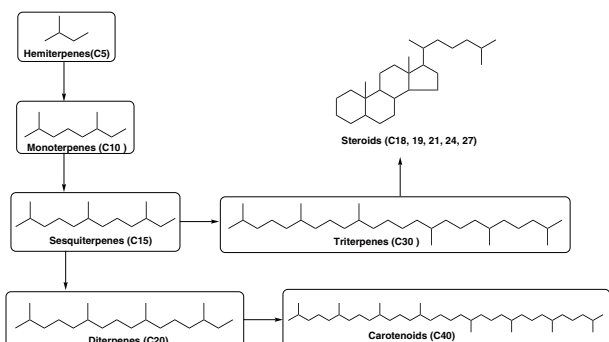


Figure 1. Biosynthetic Pathway of Terpene Skeletons

Terpenes are widespread in nature existing in marine organisms as well as in plants. Some terpenes show characteristic bioactivity such as antitumor activities, and their modes of action is currently under investigation. Since terpenes are mainly found in plants, they are frequently used as markers in plant metabolome analyses.

## ● Nomenclature

According to the IUPAC Nomenclature Appendix, 42 parent skeletons are shown.<sup>3)</sup> Practically, other common names are also used frequently. For further trivial names, please refer to References.<sup>2,4)</sup>

## ● Solubility

In general, most of the terpenes are insoluble in water but soluble in ethanol, chloroform and diethyl ether. They can be added to the buffer solution as a dimethyl sulfoxide solution to examine their activity in living organisms. Please take caution that the solution becomes suspended as the concentration level of the dissolved substance increases. It is recommended to define the optimal concentration level and volume of addition in advance. Glycosides of terpenes are more water-soluble than their aglycones.

## ● Stability

In general, monoterpenes are relatively stable. However, oily sesquiterpenes and diterpenes are less stable bearing more oxygen functional groups rendering them unsuitable for storage over longer periods. However, most of the triterpenes are solid and show good stability.

## ● Detection

Since some terpenes do not have chromophore unit, UV detection by normal-phase HPLC is difficult. As a result, RI (refractive index) detector can be used instead. Normal-phase TLC is also frequently used to visualize terpenes by spraying them with phosphomolybdic acid solution or cerium sulfate solution followed by heating.

## ● Some Tips

- Monoterpenes and some sesquiterpenes form azeotropic mixtures with the traces of water present in the sample, leading to a considerable loss during distillation. It is therefore recommended that these terpenes should be properly dried prior to their use using the following procedure:
  - (1) dissolution of the sample in an appropriate organic solvent
  - (2) drying it over anhydrous sodium or magnesium sulfate and
  - (3) removal of the solvent in vacuo.
- In NMR measurement, using two different solvents separately, deuteriochloroform ( $\text{CDCl}_3$ ) and benzene- $d_6$  ( $\text{C}_6\text{D}_6$ ), may change the signal patterns to facilitate interpretation of the spectrum (mainly for proton). In addition, some hidden signals might also appear owing to the variation in the residual water signal positions.

- During storage over longer periods, CDCl<sub>3</sub> might partially decompose to form phosgene which can damage your precious sample. Therefore care should be taken especially while using CDCl<sub>3</sub> with high deuterium ratio (no less than 99.95%D). The sample should not be stored in the NMR tube as a solution after its analysis but recovered from the tube and the solvent should be evaporated completely to prevent its decomposition.

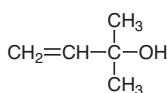
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## References

- 1) P. M. Dewick, in *Medicinal Natural Products*, 3rd ed., John Wiley & Sons, Chichester, **2009**, p. 187.
- 2) E. Breitmaier, in *Terpenes*, Wiley-VCH, Weinheim, **2006**.
- 3) P. M. Gills Jr., *Pure. Appl. Chem.* **1999**, *71*, 587.
- 4) a) For Sesquiterpenes: B. M. Fraga, *Nat. Prod. Rep.* **2008**, *25*, 1180.  
b) For Diterpenes: J. R. Hanson, *Nat. Prod. Rep.* **2007**, *24*, 1332.  
c) For Triterpenes: J. D. Connolly, R. A. Hill, *Nat. Prod. Rep.* **2008**, *25*, 794.

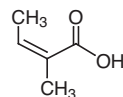
## Hemiterpenes

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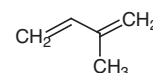
2-Methyl-3-buten-2-ol  
CAS RN: 115-18-4

**A1136** 1g 5g



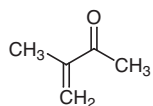
Angelic Acid  
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**I0160** 25mL 500mL



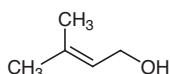
Isoprene  
(stabilized with TBC)  
CAS RN: 78-79-5

**M0378** 25mL



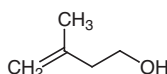
3-Methyl-3-buten-2-one  
(stabilized with HQ)  
CAS RN: 814-78-8

**M0714** 25mL 100mL 500mL



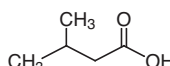
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CAS RN: 556-82-1

**M0726** 25mL 100mL 500mL



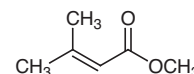
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**M0182** 25mL 500mL



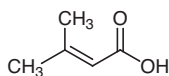
Isovaleric Acid  
CAS RN: 503-74-2

**M2052** 25g



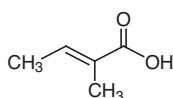
Methyl 3,3-Dimethylacrylate  
CAS RN: 924-50-5

**M0543** 25g 100g 500g



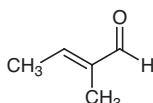
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**T0246** 25g 100g 500g



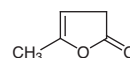
Tiglic Acid  
CAS RN: 80-59-1

**T1003** 5mL 25mL



*trans*-2-Methyl-2-butenal  
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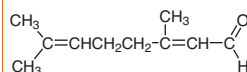
**A1090** 25g 100g



$\alpha$ -Angelicalactone  
CAS RN: 591-12-8

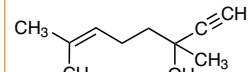
## Acyclic Monoterpenes

**D0762** 25mL



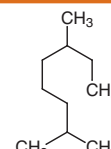
Citral (*cis*- and *trans*- mixture)  
CAS RN: 5392-40-5

**D5752** 25mL 100mL



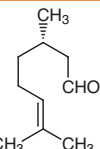
( $\pm$ )-Dehydrolinalool  
CAS RN: 29171-20-8

**D1212** 1mL



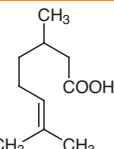
2,6-Dimethyloctane  
CAS RN: 2051-30-1

**C1454** 5mL 25mL



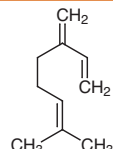
(-)-Citronellal  
CAS RN: 5949-05-3

**C1708** 25mL



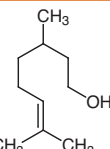
Citronellic Acid  
CAS RN: 502-47-6

**M0235** 25mL 500mL



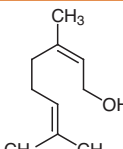
Myrcene (stabilized with BHT)  
CAS RN: 123-35-3

**C0370** 25mL 100mL 500mL



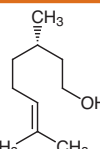
$\beta$ -Citronellol  
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**N0077** 25mL 100mL 500mL



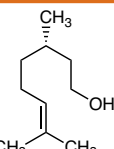
Nerol  
CAS RN: 106-25-2

**C1466** 25mL



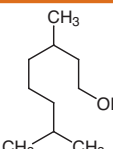
(-)- $\beta$ -Citronellol (>95.0%)  
CAS RN: 7540-51-4

**C3619** 5mL 25mL



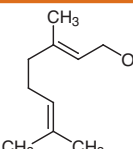
(-)- $\beta$ -Citronellol (>98.0%)  
CAS RN: 7540-51-4

**D1442** 25mL 500mL



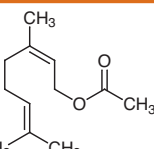
3,7-Dimethyl-1-octanol  
CAS RN: 106-21-8

**G0027** 25mL 100mL 500mL



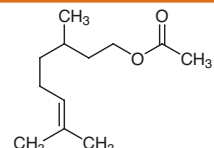
Geraniol  
CAS RN: 106-24-1

**N0463** 25mL



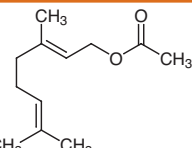
Neryl Acetate  
CAS RN: 141-12-8

**C0915** 25mL



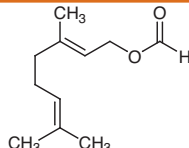
Citronellyl Acetate  
CAS RN: 150-84-5

**G0028** 25mL 100mL 500mL



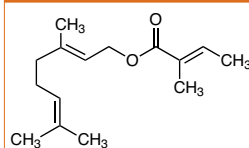
Geranyl Acetate  
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**G0218** 25mL



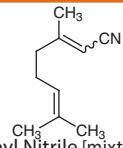
Geranyl Formate  
CAS RN: 105-86-2

**G0430** 5mL 25mL



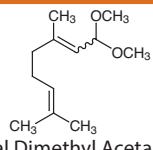
Geranyl Tiglate  
CAS RN: 7785-33-3

**G0241** 25mL



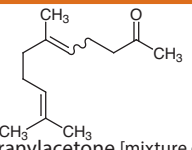
Geranyl Nitrile [mixture of (*E*)- and (*Z*)- isomers, (1:1)]  
CAS RN: 5146-66-7

**C1211** 25mL 500mL



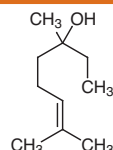
Citral Dimethyl Acetal  
(*cis*- and *trans*- mixture)  
CAS RN: 7549-37-3

**G0236** 25mL



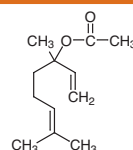
Geranylacetone [mixture of (*E*)- and (*Z*)- isomers, (3:2)]  
CAS RN: 689-67-8

**D1592** 25mL 500mL



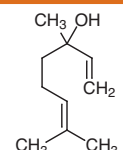
Dihydrolinalool  
CAS RN: 18479-51-1

**L0049** 25mL 500mL



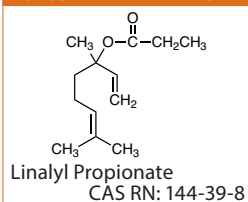
Linalyl Acetate  
CAS RN: 115-95-7

**L0048** 25mL 500mL

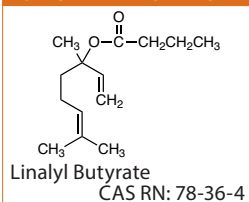


Linalool  
CAS RN: 78-70-6

L0265 25mL

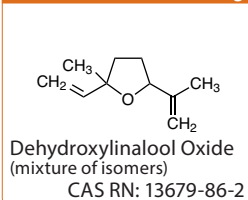


L0275 5mL 25mL

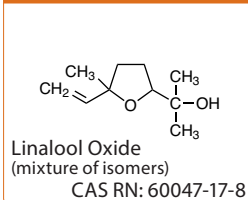


## Monocyclic Monoterpenes

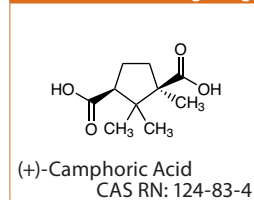
I0744 25g



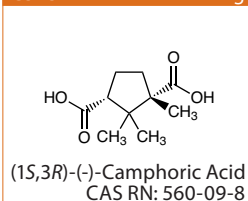
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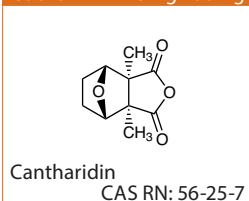
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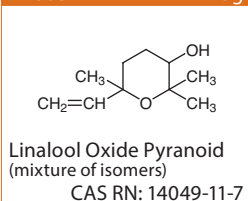
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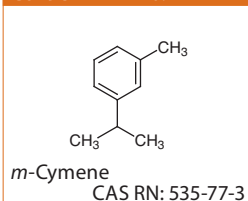
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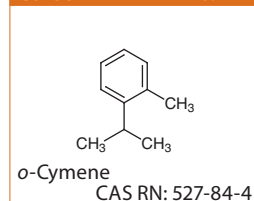
T2605 25g



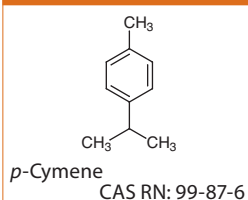
C0798 0.1mL 1mL



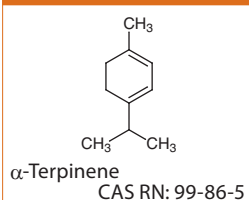
C0799 0.1mL



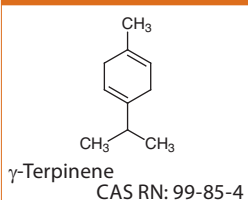
C0513 25mL 500mL



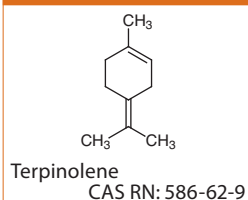
M0317 25mL 500mL



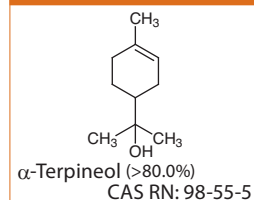
M0318 25mL 500mL



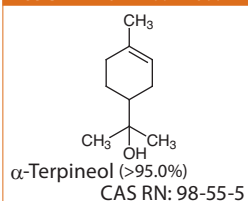
T0817 25mL 500mL



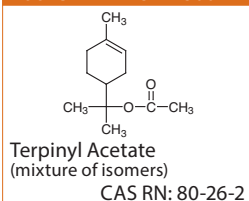
T0022 25mL 500mL



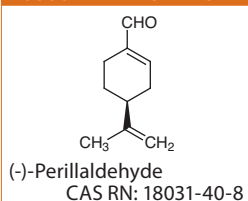
T0984 25mL 100mL 500mL



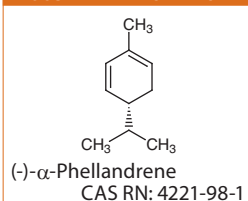
T0023 25mL 500mL



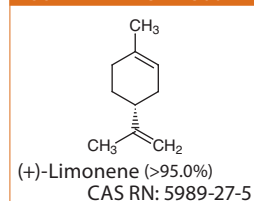
P0866 5mL 25mL



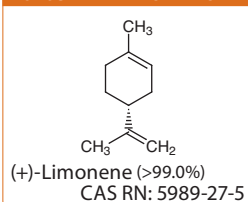
M0051 5mL 25mL



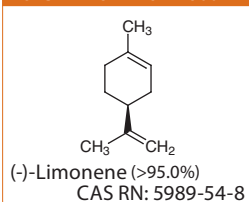
L0047 25mL 500mL



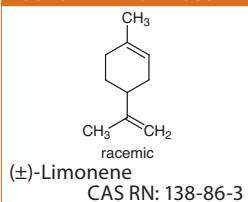
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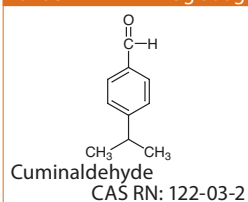
L0132 5mL 25mL 500mL



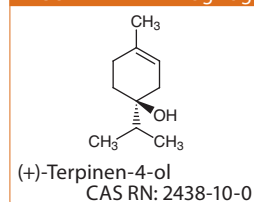
L0046 25mL 500mL



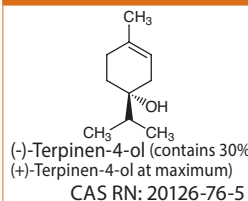
I0168 25g 500g



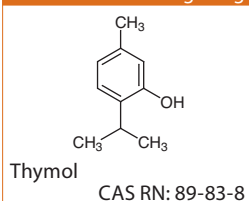
T2581 5g 25g



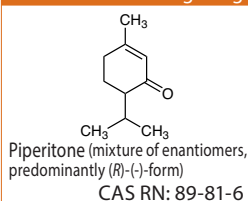
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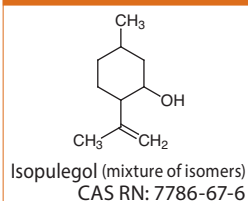
M0410 25g 500g



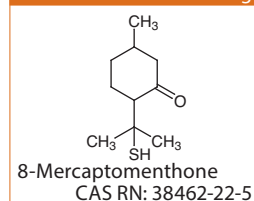
P1783 25g 100g



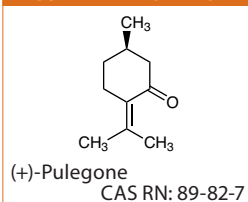
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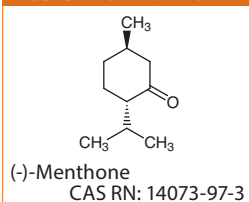
M2023 5g



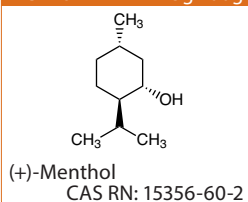
P2331 5mL 25mL



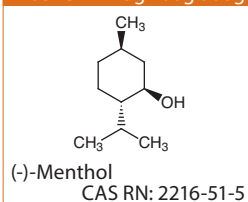
M0513 25mL 100mL 500mL



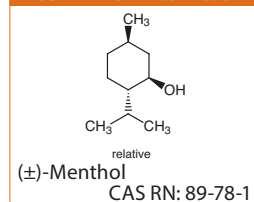
M3170 25g 100g

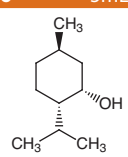
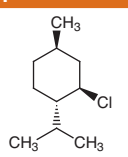
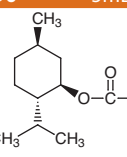
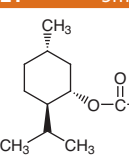
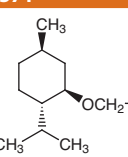
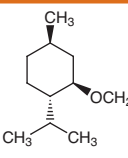
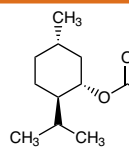
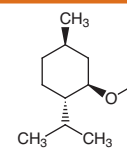
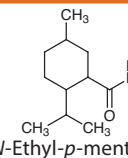
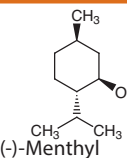
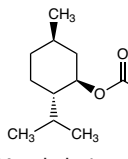
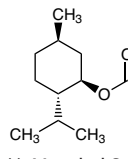
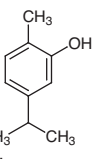
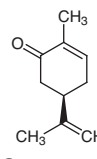
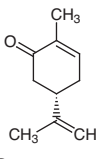
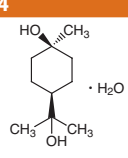
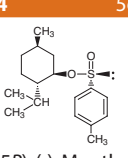
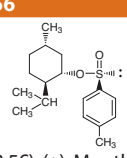
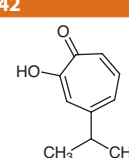
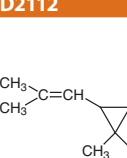
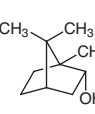
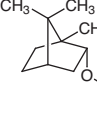
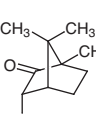
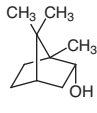
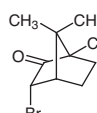
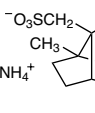
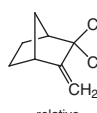
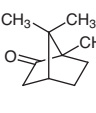
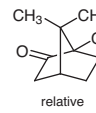
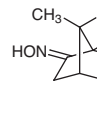
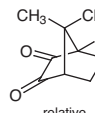
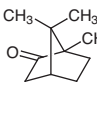
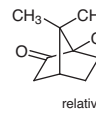
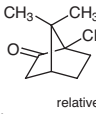
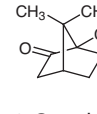
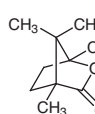
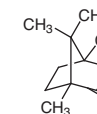
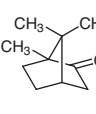


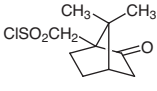
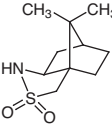
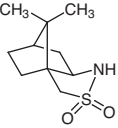
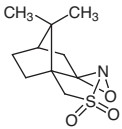
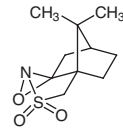
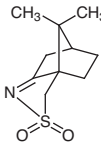
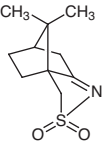
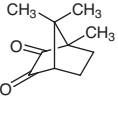
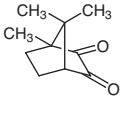
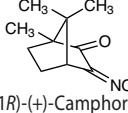
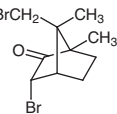
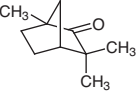
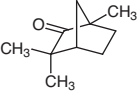
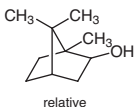
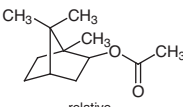
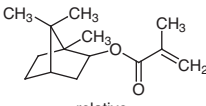
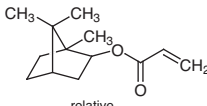
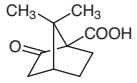
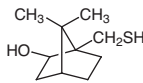
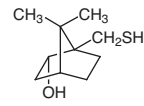
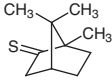
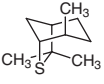
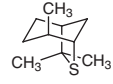
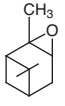
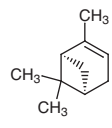
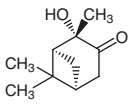
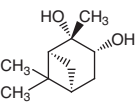
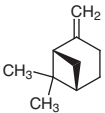
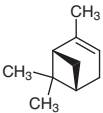
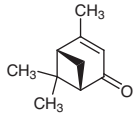
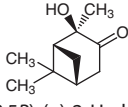
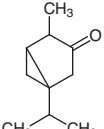
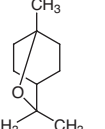
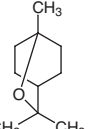
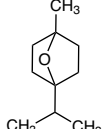
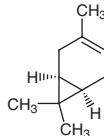
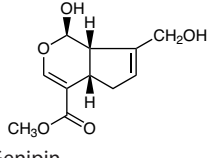
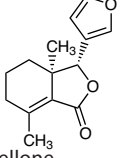
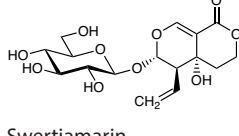
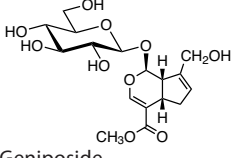
M0545 25g 100g 500g

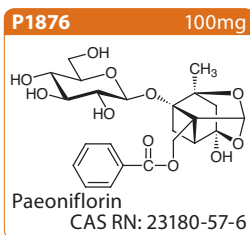


M0321 25mL 100mL 500mL

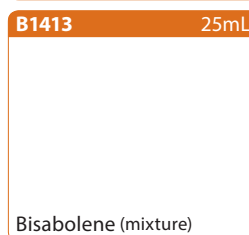
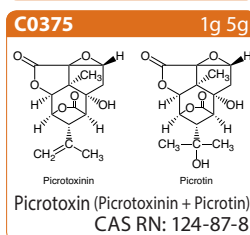
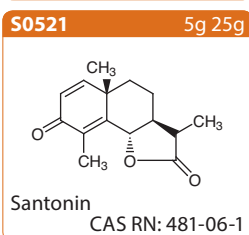
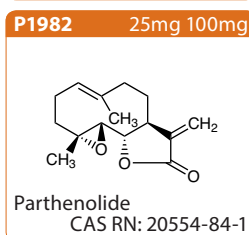
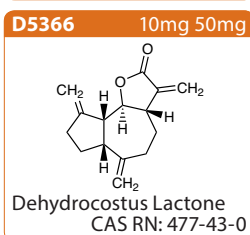
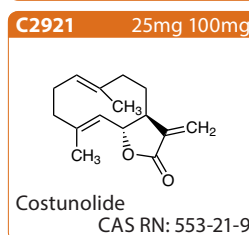
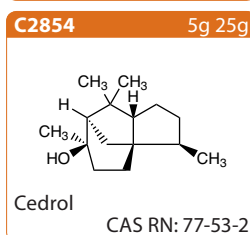
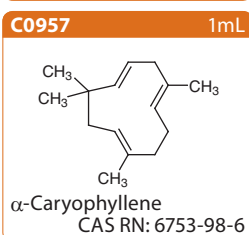
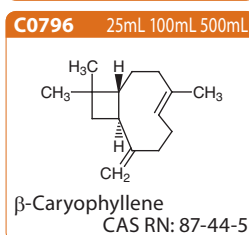
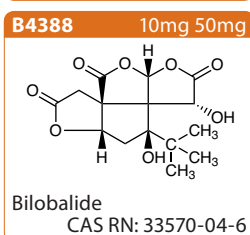
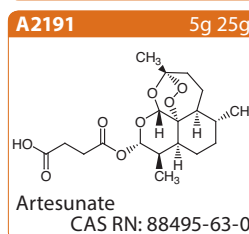
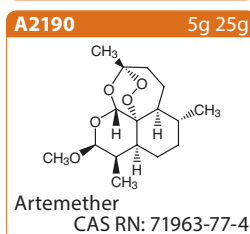
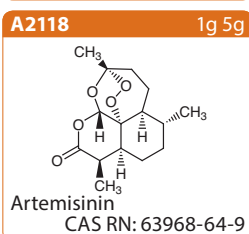
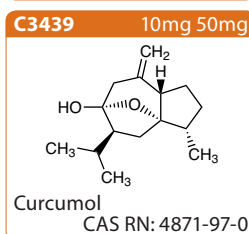
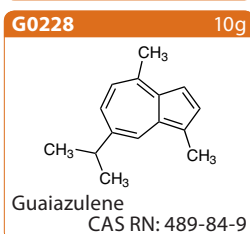
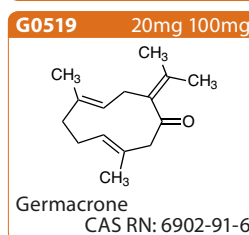
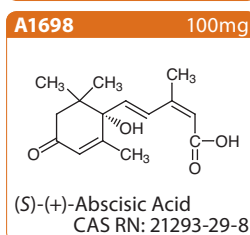
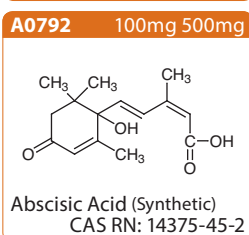
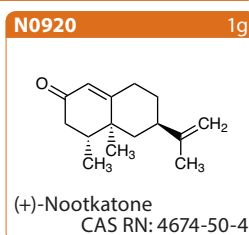
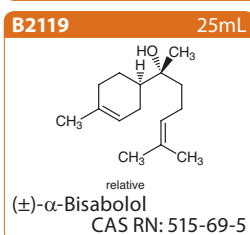
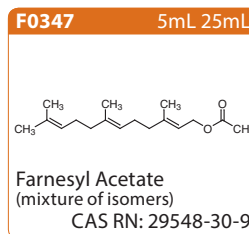
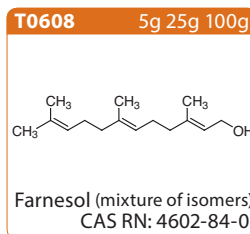
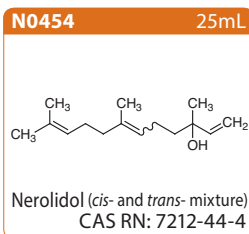


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<p><b>M0573</b> 5g 25g</p>  <p>(-)-Menthoxycetic Acid CAS RN: 40248-63-3</p>	<p><b>M2631</b> 1mL 5mL</p>  <p>(+)-Menthyl Acetate CAS RN: 5157-89-1</p>	<p><b>A1107</b> 25mL</p>  <p>(-)-Menthyl Acetate CAS RN: 2623-23-6</p>	<p><b>E0796</b> 5g 25g</p>  <p>N-Ethyl-p-menthane-3-carboxamide CAS RN: 39711-79-0</p>	<p><b>I0790</b> 25g</p>  <p>(-)-Menthyl 2,2-Dihydroxyacetate CAS RN: 111969-64-3</p>
<p><b>I0889</b> 5g 25g</p>  <p>L-Menthyl L-Lactate CAS RN: 61597-98-6</p>	<p><b>M2482</b> 25g</p>  <p>(-)-Menthyl Succinate CAS RN: 77341-67-4</p>	<p><b>C0026</b> 25g 100g 500g</p>  <p>Carvacrol CAS RN: 499-75-2</p>	<p><b>C0703</b> 25mL 100mL 500mL</p>  <p>(R)-(-)-Carvone CAS RN: 6485-40-1</p>	<p><b>C0704</b> 25mL</p>  <p>(S)-(-)-Carvone CAS RN: 2244-16-8</p>
<p><b>T2344</b> 25g</p>  <p>relative Terpin Monohydrate CAS RN: 2451-01-6</p>	<p><b>M1044</b> 5g 25g</p>  <p>(1R,2S,5R)-(-)-Menthyl (S)-p-Toluenesulfinate CAS RN: 1517-82-4</p>	<p><b>M1066</b> 1g 5g</p>  <p>(1S,2R,5S)-(+)-Menthyl (R)-p-Toluenesulfinate CAS RN: 91796-57-5</p>	<p><b>H0142</b> 1g 5g</p>  <p>Hinokitiol CAS RN: 499-44-5</p>	<p><b>D2112</b> 25g 100g</p>  <p>Ethyl Chrysanthemate CAS RN: 97-41-6</p>
<p><b>Bicyclic Monoterpenes</b></p>				
<p><b>B0525</b> 25g 500g</p>  <p>relative Borneol (contains ca. 20% Isoborneol) CAS RN: 507-70-0</p>	<p><b>B0526</b> 25mL</p>  <p>relative Bornyl Acetate (contains ca. 20% Isobornyl Acetate) CAS RN: 5655-61-8</p>	<p><b>B0567</b> 25g 500g</p>  <p>(+)-3-Bromocamphor CAS RN: 10293-06-8</p>		
<p><b>B1012</b> 25g 500g</p>  <p>(-)-Borneol CAS RN: 464-45-9</p>	<p><b>B1125</b> 5g 25g</p>  <p>(+)-3-Bromocamphor-8-sulfonic Acid Ammonium Salt CAS RN: 14575-84-9</p>	<p><b>B4412</b> 1g 5g</p>  <p>(-)-3-Bromocamphor-8-sulfonic Acid Ammonium Salt CAS RN: 55870-50-3</p>	<p><b>C0009</b> 25g 100g</p>  <p>relative (±)-Camphene (contains ca. 20% Tricyclene) CAS RN: 79-92-5</p>	<p><b>C0010</b> 25g 500g</p>  <p>(+)-Camphor CAS RN: 464-49-3</p>
<p><b>C0011</b> 25g 500g</p>  <p>relative (±)-Camphor CAS RN: 76-22-2</p>	<p><b>C0013</b> 1g 5g 25g</p>  <p>(1R)-Camphor Oxime CAS RN: 2792-42-9</p>	<p><b>C0014</b> 5g 25g</p>  <p>relative (±)-Camphorquinone CAS RN: 10373-78-1</p>	<p><b>C0015</b> 25g 100g 500g</p>  <p>(+)-10-Camphorsulfonic Acid CAS RN: 3144-16-9</p>	<p><b>C0016</b> 25g 100g 500g</p>  <p>relative (±)-10-Camphorsulfonic Acid CAS RN: 5872-08-2</p>
<p><b>C0017</b> 25g</p>  <p>relative Sodium (±)-10-Camphorsulfonate CAS RN: 34850-66-3</p>	<p><b>C0998</b> 5g 25g</p>  <p>(+)-10-Camphorsulfonyl Chloride CAS RN: 21286-54-4</p>	<p><b>C1021</b> 1g 5g</p>  <p>(-)-Camphanic Acid CAS RN: 13429-83-9</p>	<p><b>C1022</b> 1g 5g 25g</p>  <p>(-)-Camphanic Chloride CAS RN: 39637-74-6</p>	<p><b>C1251</b> 5g</p>  <p>(-)-Camphor CAS RN: 464-48-2</p>

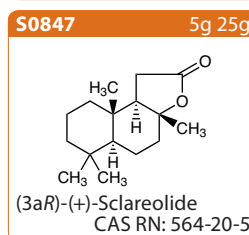
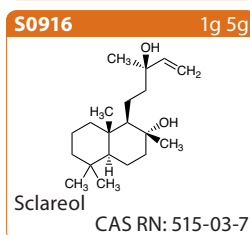
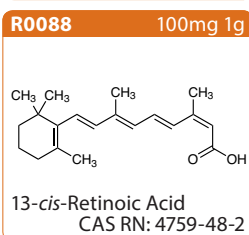
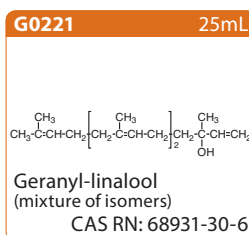
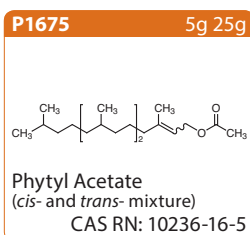
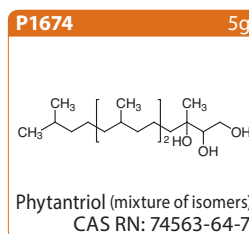
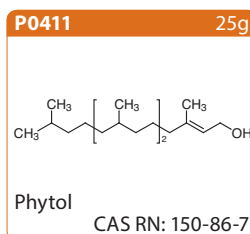
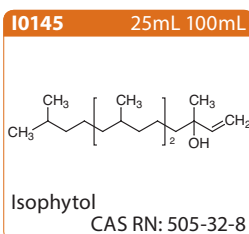
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<b>C1391</b> 5g  (+)-10-Camphorsulfonylimine CAS RN: 107869-45-4	<b>C1393</b> 5g  (-)-10-Camphorsulfonylimine CAS RN: 60886-80-8	<b>C1482</b> 1g 5g  (1R)-(-)-Camphorquinone CAS RN: 10334-26-6	<b>C1660</b> 1g 5g  (1S)-(+)-Camphorquinone CAS RN: 2767-84-2	<b>C1661</b> 1g  anti-(1R)-(+)-Camphorquinone 3-Oxime CAS RN: 31571-14-9
<b>D2715</b> 5g 25g  (+)-3,9-Dibromocamphor CAS RN: 10293-10-4	<b>F0163</b> 25mL  (+)-Fenchone CAS RN: 4695-62-9	<b>F0164</b> 25mL 500mL  (-)-Fenchone CAS RN: 7787-20-4	<b>I0275</b> 25g 500g  (±)-Isborneol CAS RN: 124-76-5	<b>I0306</b> 25mL 500mL  Isobornyl Acetate CAS RN: 125-12-2
<b>I0617</b> 25g 500g  Isobornyl Methacrylate (stabilized with MEHQ) CAS RN: 7534-94-3	<b>I0638</b> 25g 500g  Isobornyl Acrylate (stabilized with MEHQ) CAS RN: 5888-33-5	<b>K0028</b> 1g 5g  (S)-(+)-Ketopinic Acid CAS RN: 40724-67-2	<b>M1070</b> 1g  (1S)-(-)-10-Mercaptoisborneol CAS RN: 71242-58-5	<b>M1341</b> 100mg  (1S)-(-)-10-Mercaptoborneol CAS RN: 71242-59-6
<b>T1863</b> 1g 5g  (1R)-(-)-Thiocamphor CAS RN: 53402-10-1	<b>T2578</b> 1g 5g  (1R,4R,5R)-4,7,7-Trimethyl-6-thiabicyclo[3.2.1]octane CAS RN: 5718-75-2	<b>T2579</b> 1g 5g  (1S,4S,5S)-4,7,7-Trimethyl-6-thiabicyclo[3.2.1]octane CAS RN: 1208985-45-8	<b>P1362</b> 25mL 250mL  α-Pinene Oxide CAS RN: 1686-14-2	<b>P1099</b> 25mL 500mL  (1R)-(+)-α-Pinene CAS RN: 7785-70-8
<b>H0863</b> 1g 5g  (1S,2S,5S)-(-)-2-Hydroxy-3-pinone CAS RN: 1845-25-6	<b>P1934</b> 5g 25g  (1S,2S,3R,5S)-(+)-2,3-Pinane diol CAS RN: 18680-27-8	<b>P0441</b> 25mL 500mL  (-)-β-Pinene CAS RN: 18172-67-3	<b>P0440</b> 25mL 500mL  (1S)-(-)-α-Pinene CAS RN: 7785-26-4	<b>V0072</b> 25g  (-)-Verbenone CAS RN: 1196-01-6
<b>H0862</b> 1g 5g  (1R,2R,5R)-(+)-2-Hydroxy-3-pinone CAS RN: 24047-72-1	<b>T0989</b> 5mL 25mL  Thujone (α- and β- mixture) CAS RN: 1125-12-8	<b>C0542</b> 25mL  1,8-Cineole (>99.0%) CAS RN: 470-82-6	<b>C0934</b> 25mL 100mL 500mL  1,8-Cineole (>98.0%) CAS RN: 470-82-6	<b>C3652</b> 25g 100g  1,4-Cineole CAS RN: 470-67-7
<b>C0047</b> 25mL 500mL  (+)-3-Carene CAS RN: 498-15-7	<b>G0458</b> 25mg 100mg  Genipin CAS RN: 6902-77-8	<b>F1187</b> 10mg 50mg  Fraxinellone CAS RN: 28808-62-0	<b>S0897</b> 25mg  Swertiamarin CAS RN: 17388-39-5	<b>G0385</b> 100mg 1g  Geniposide CAS RN: 24512-63-8



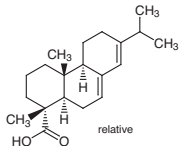
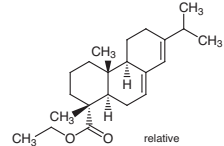
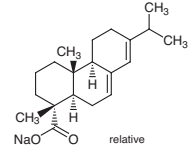
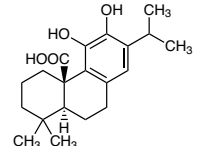
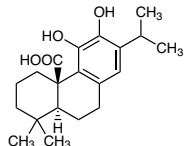
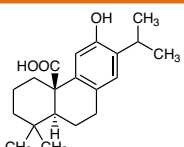
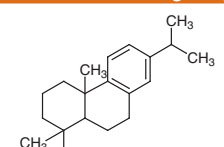
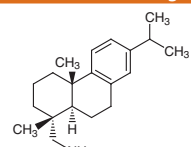
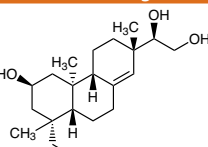
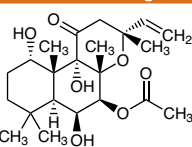
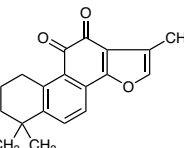
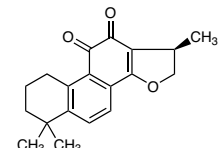
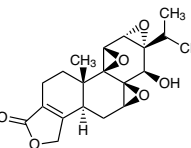
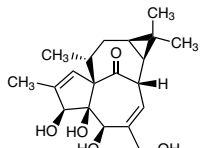
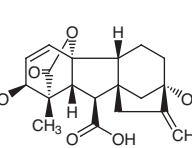
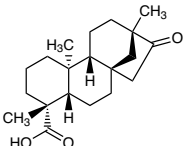
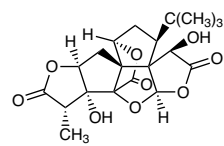
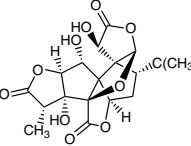
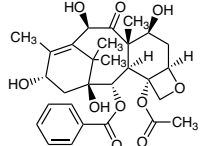
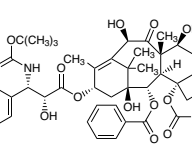
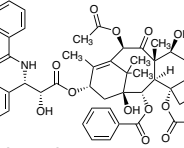
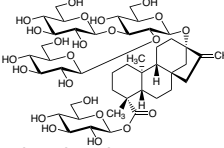
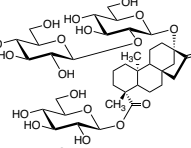
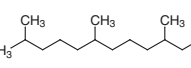
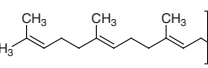
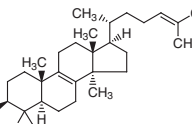
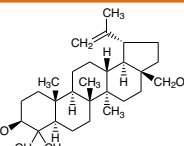
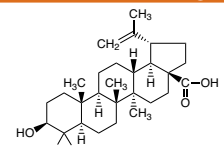
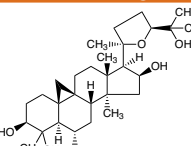
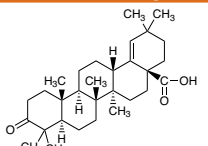
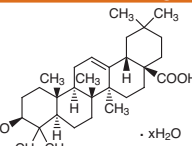
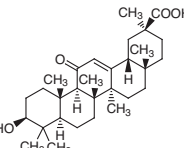
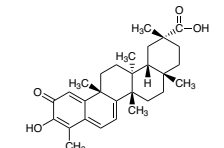
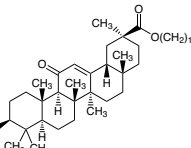
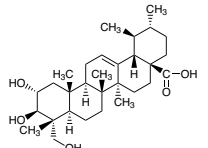
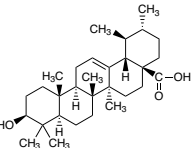
## Sesquiterpenes



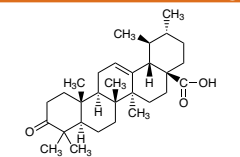
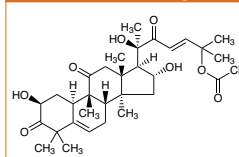
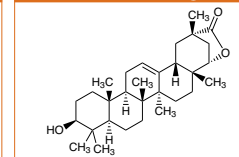
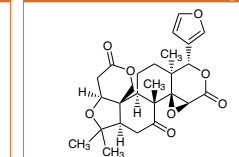
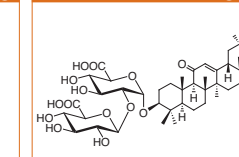
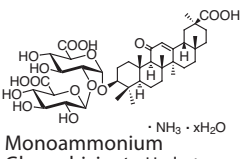
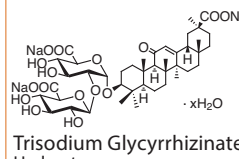
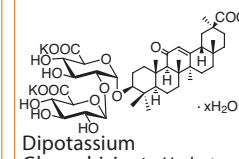
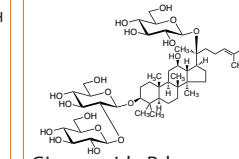
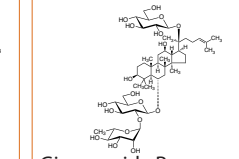
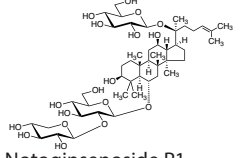
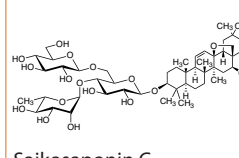
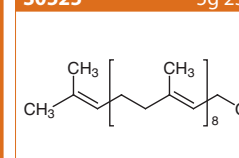
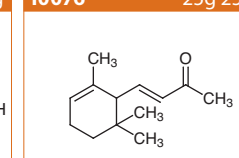
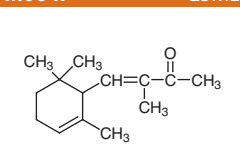
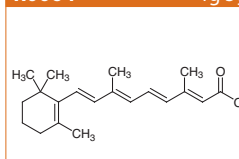
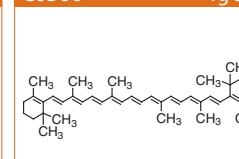
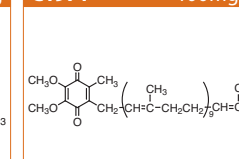
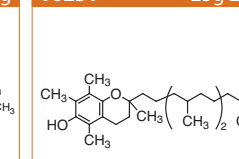
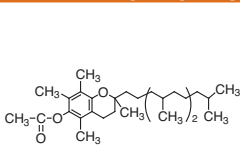
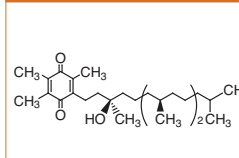
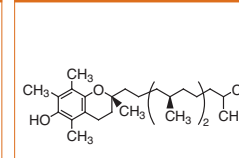
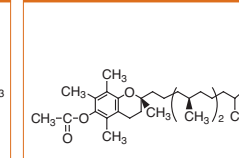
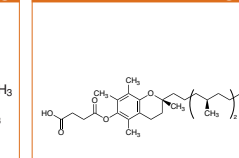
## Diterpenes





<b>A0001</b> 25g 100g 500g  Abietic Acid CAS RN: 514-10-3	<b>A0002</b> 25g  Ethyl Abietate CAS RN: 631-71-0	<b>A0651</b> 5g 25g  Sodium Abietate CAS RN: 14351-66-7	<b>C2488</b> 20mg 100mg  Carnosic Acid (Synthetic) CAS RN: 3650-09-7	<b>C3477</b> 20mg 100mg  Carnosic Acid CAS RN: 3650-09-7
<b>P1933</b> 100mg  Piferic Acid CAS RN: 67494-15-9	<b>D1180</b> 25g 500g  Dehydroabietylamine	<b>D1588</b> 5g 25g  (+)-Dehydroabietylamine CAS RN: 1446-61-3	<b>K0059</b> 25mg 100mg  Kirenol CAS RN: 52659-56-0	<b>F0855</b> 10mg 50mg  Forskolol CAS RN: 66575-29-9
<b>T2987</b> 10mg 50mg  Tanshinone IIA CAS RN: 568-72-9	<b>C3363</b> 25mg 100mg  Cryptotanshinone CAS RN: 35825-57-1	<b>T2899</b> 10mg  Triptolide CAS RN: 38748-32-2	<b>I1112</b> 10mg 50mg  Ingenol CAS RN: 30220-46-3	<b>G0029</b> 100mg 1g 5g  Gibberellin A <sub>3</sub> CAS RN: 77-06-5
<b>I1069</b> 100mg 500mg  Isosteviol CAS RN: 27975-19-5	<b>G0521</b> 10mg 50mg  Ginkgolide A CAS RN: 15291-75-5	<b>G0553</b> 25mg 100mg  Ginkgolide B CAS RN: 15291-77-7	<b>D4148</b> 100mg 500mg  10-Deacetylbaaccatin III CAS RN: 32981-86-5	<b>D4102</b> 100mg 1g  Docetaxel CAS RN: 114977-28-5
<b>P1632</b> 100mg  Paclitaxel CAS RN: 33069-62-4	<b>R0095</b> 5g 25g  Rebaudioside A CAS RN: 58543-16-1	<b>S0594</b> 25g  Stevioside CAS RN: 57817-89-7		
<b>Triterpenes</b>				
<b>H0096</b> 25mL 100mL 500mL  Squalene CAS RN: 111-01-3	<b>H0097</b> 25mL 100mL 500mL  Squalene CAS RN: 111-02-4	<b>C0427</b> 25g  Lanosterol CAS RN: 79-63-0		
<b>B0803</b> 100mg  Betulinol CAS RN: 473-98-3	<b>B2836</b> 100mg 1g  Betulinic Acid CAS RN: 472-15-1	<b>C3469</b> 25mg 100mg  Cycloastragenol CAS RN: 78574-94-4	<b>M2610</b> 5mg 25mg  Moronic Acid CAS RN: 6713-27-5	<b>O0317</b> 5g 25g  Oleanolic Acid Hydrate CAS RN: 508-02-1
<b>G0149</b> 1g 25g  Glycyrrhetic Acid CAS RN: 471-53-4	<b>C2737</b> 25mg  Celastrol CAS RN: 34157-83-0	<b>S0988</b> 5g 25g  Stearyl Glycyrrhetinate CAS RN: 13832-70-7	<b>A2475</b> 50mg 200mg  Asiatic Acid CAS RN: 464-92-6	<b>U0065</b> 100mg 1g  Ursolic Acid CAS RN: 77-52-1

## Terpenes

<p><b>O0508</b> 100mg</p>  <p>3-Oxours-12-en-28-ic Acid CAS RN: 6246-46-4</p>	<p><b>C3442</b> 5mg 25mg</p>  <p>Cucurbitacin B CAS RN: 6199-67-3</p>	<p><b>W0011</b> 5mg 25mg</p>  <p>Wilforlide A CAS RN: 84104-71-2</p>	<p><b>L0258</b> 100mg 1g</p>  <p>Limonin CAS RN: 1180-71-8</p>	<p><b>G0150</b> 1g 25g</p>  <p>Glycyrrhizin CAS RN: 1405-86-3</p>
<p><b>G0151</b> 1g 25g</p>  <p>Monoammonium Glycyrrhizinate Hydrate CAS RN: 53956-04-0</p>	<p><b>G0217</b> 25g</p>  <p>Trisodium Glycyrrhizinate Hydrate CAS RN: 71277-78-6</p>	<p><b>G0270</b> 25g</p>  <p>Dipotassium Glycyrrhizinate Hydrate CAS RN: 68797-35-3</p>	<p><b>G0550</b> 25mg 100mg</p>  <p>Ginsenoside Rd CAS RN: 52705-93-8</p>	<p><b>G0551</b> 50mg 250mg</p>  <p>Ginsenoside Re CAS RN: 52286-59-6</p>
<p><b>N1129</b> 10mg 50mg</p>  <p>Notoginsenoside R1 CAS RN: 80418-24-2</p>	<p><b>A3189</b> 25mg</p>  <p>Saikosaponin C CAS RN: 20736-08-7</p>	<div style="background-color: #f4a460; padding: 10px; text-align: center;"> <h2 style="color: white; margin: 0;">Other Terpenes</h2> </div>		
<p><b>S0525</b> 5g 25g</p>  <p>Solanesol CAS RN: 13190-97-1</p>	<p><b>I0076</b> 25g 250g</p>  <p><math>\alpha</math>-Ionone CAS RN: 127-41-3</p>			
<p><b>M0647</b> 25mL</p>  <p><math>\alpha</math>-iso-Methylionone CAS RN: 127-51-5</p>	<p><b>R0064</b> 1g 5g</p>  <p>Retinoic Acid CAS RN: 302-79-4</p>	<p><b>C0560</b> 1g 5g</p>  <p><math>\beta</math>-Carotene CAS RN: 7235-40-7</p>	<p><b>C1971</b> 100mg 1g</p>  <p>Coenzyme Q<sub>10</sub> CAS RN: 303-98-0</p>	<p><b>T0251</b> 25g 250g</p>  <p>DL-<math>\alpha</math>-Tocopherol CAS RN: 10191-41-0</p>
<p><b>T0252</b> 25g 100g 500g</p>  <p>DL-<math>\alpha</math>-Tocopherol Acetate CAS RN: 7695-91-2</p>	<p><b>T2283</b> 500mg</p>  <p>D-<math>\alpha</math>-Tocopherylquinone CAS RN: 7559-04-8</p>	<p><b>T2309</b> 25g</p>  <p>D-<math>\alpha</math>-Tocopherol CAS RN: 59-02-9</p>	<p><b>T2322</b> 25g</p>  <p>D-<math>\alpha</math>-Tocopherol Acetate CAS RN: 58-95-7</p>	<p><b>T2628</b> 5g 25g</p>  <p>D-<math>\alpha</math>-Tocopherol Succinate CAS RN: 4345-03-3</p>
<p><b>C0781</b> 25g</p> <p>Capsanthin (=Paprika Extract) (Vegetable oil solution) CAS RN: 465-42-9</p>	<p><b>C1527</b> 25g</p> <p>Crocin (Gardenia Fruits Extract) CAS RN: 42553-65-1</p>	<p><b>M0363</b> 25mL</p> <p>Methylionone (mixture of <math>\alpha</math>- and <math>\beta</math>-, predominantly <math>\alpha</math>-<i>n</i>-isomer) CAS RN: 7779-30-8</p>		

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