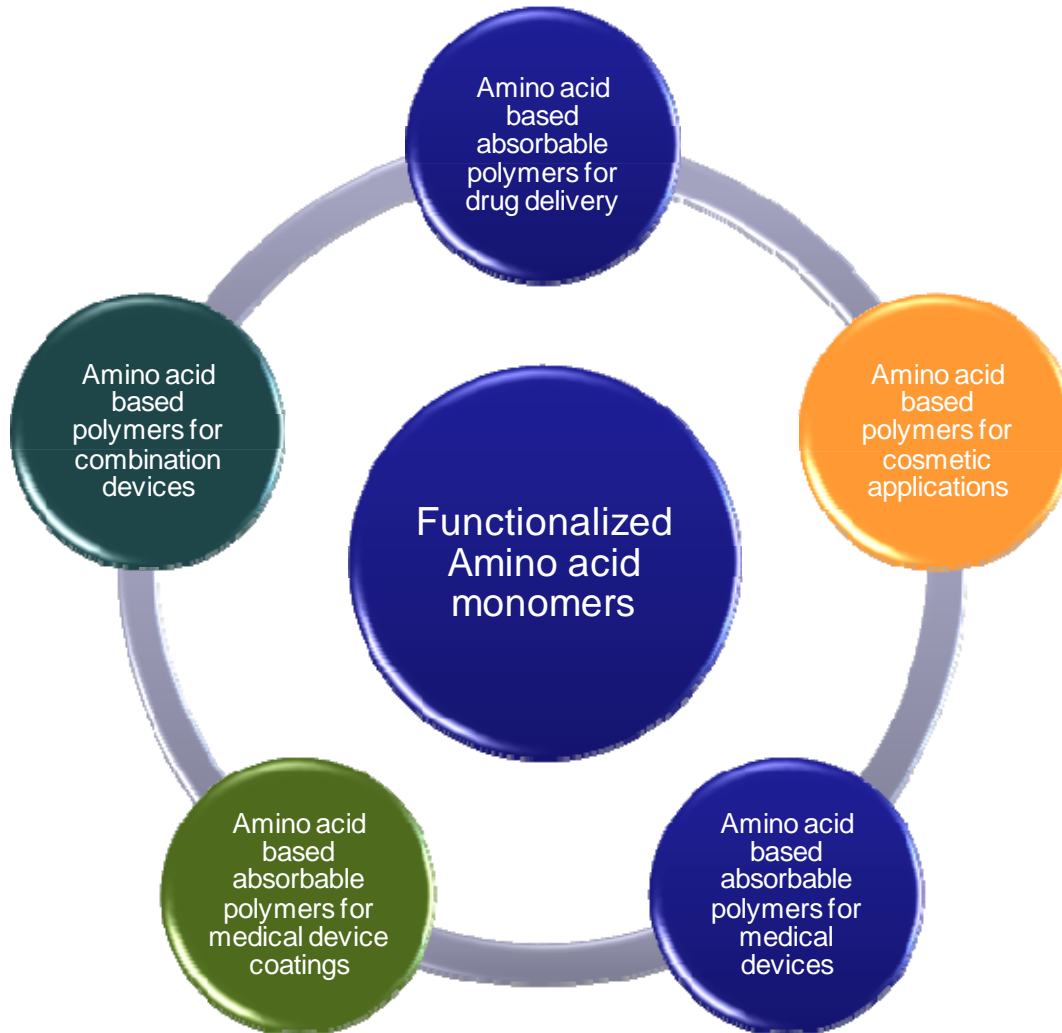




New Building Blocks

Functionalized Amino Acid Monomers



EB Bezwada Biomedical, LLC

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Hillsborough, New Jersey, 08844 USA
Tel: (908)-281-7529, Fax: (908)-359-1179



Message from President & CEO



Think Absorbable. Think Bezwada Biomedical

At Bezwada Biomedical, we understand the challenges and risks involved in bringing highly differentiated and technically advanced bioabsorbable product to the market. By combining our years of experience and unequalled expertise in developing absorbable polymers, we evaluate the individual needs of our customers and develop smart, value added solutions ideally matched to their end-use requirements.

We invite you to look upon us and our catalog as a resource for not only absorbable monomers, macromers and polymers but also information and ideas. With our exciting patent pending absorbable technology platforms, we would like to help our customers to get ahead of the competition.

What distinguishes us from our competitors is that in addition to R&D facilities in USA, we have state-of-the-art custom synthesis, upscaling, analytical, contract research and manufacturing facility located in India. This enables us to develop, manufacture and deliver high quality and highly differentiated polymeric biomaterials at a reduced cost.

We are ready to work with you today, and the sooner we begin collaborating, the quicker you can expand your technology platform and product portfolio. In addition, our ongoing research and development work promises the potential for even more exciting opportunities. So contact us today to discuss how we can meet your current needs and work together for a better tomorrow.

Rao S Bezwada, Ph.D.



Functionalized Amino Acid Monomers for Biomedical and Cosmetic Applications

This brochure is intended to provide readers with an overview of hydrolysable functionalized amino acid monomers developed by our company. These monomers were prepared by the functionalization of amino acid molecules such as Tyrosine and Lysine with safe and biocompatible molecules such as glycolic acid, lactic acid, caprolactone and p-dioxanone. These safe and biocompatible molecules are the key components of majority of absorbable medical devices.

The functionalized amino acid monomers developed by our company are expected to degrade hydrolytically into safe and biocompatible molecules. Furthermore, they can be used to synthesize absorbable polyesteramides with tunable physical properties and hydrolytic degradation profiles. Moreover, these functionalized amino acid monomers will enable us to control the solubility of the derived absorbable polyesteramides. These absorbable polymers derived from functionalized amino acid monomers will find use in a number of potential biomedical and cosmetic applications including controlled release applications, implantable medical devices, meshes and tissue engineering scaffolds.



1.0 Functionalized Amino acid monomers

The past 20 years have seen intensive exploration of synthetic polymers derived from naturally occurring L-amino acids such as poly (amino acids), pseudo-poly (amino acids) and copolymers of amino acids and non-amino acids as biomaterials for various biomedical applications.

There are primarily two reasons for the interest in L-amino acid derived polymers for biomedical applications

- The polymers are degradable under physiological conditions into amino-acids which are building blocks of proteins
- These polymers can be regarded as analogs of natural tissue

Amino acid based polymers developed and studied so far for biomedical applications display either very slow or uncontrollable in vivo hydrolytic degradation profiles. Many of them have marginal engineering properties. This poses major obstacles for practical applications of these polymers for biomedical applications.

In order to overcome these obstacles while addressing the unmet needs of our customers, we have developed functionalized amino acid monomers. These monomers were prepared by functionalizing amino acids such as Tyrosine and Lysine with safe and biocompatible molecules such as glycolic acid, lactic acid, caprolactone and p-dioxanone. These safe and biocompatible molecules are the key components of majority of absorbable medical devices ranging from sutures, staples, orthopedic screws and implantable surgical devices to tissue engineering scaffolds. **Figure 1 and 2** below depicts the structure of some of the functionalized Tyrosine and Lysine monomers respectively, developed by our company.

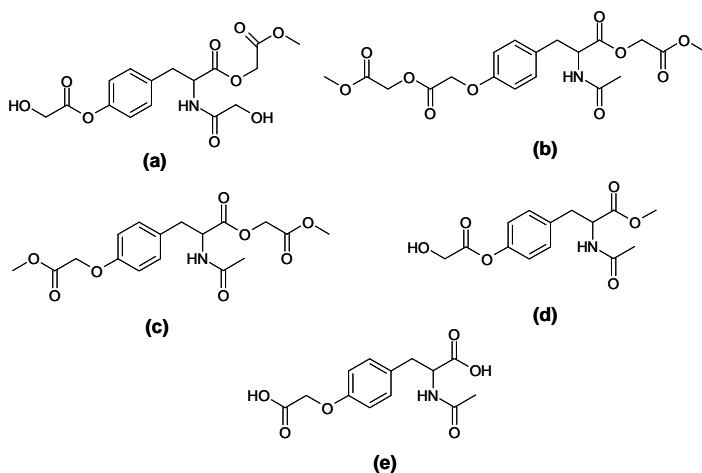


Figure 1 Selected examples of functionalized Tyrosine monomers with varying hydrolytic degradation rates

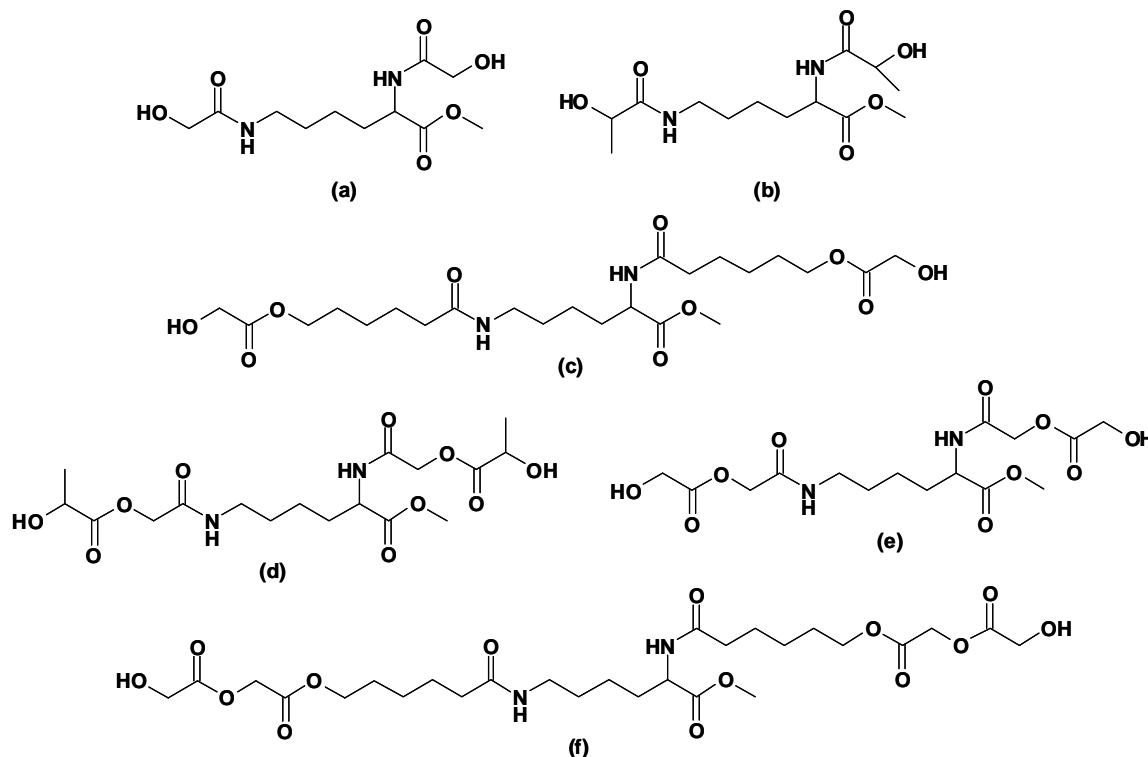


Figure 2 Selected examples of functionalized Lysine monomers with varying hydrolytic degradation rates

2.0 Hydrolysable Polymers from Functionalized Amino Acids

The functionalized amino acid monomers were used to synthesize the hydrolytically degradable polymers with varying hydrolytic degradation profiles as well as physical and mechanical properties. For example, functionalized Tyrosine monomers depicted in Figures 1 (b), (c) and (e) were used to prepare hydrolytically degradable polymers depicted in Figures 3 (a) (b) and (c) respectively via condensation polymerization with diol such as ethylene glycol. Functionalized amino acid monomers depicted in Figures 1 (a) and (e) were used to prepare hydrolytically degradable polymers depicted in Figures 3 (d) and (e) respectively via self-condensation polymerization.

These polymers have varying hydrolytic degradation rates. For example, polymer derived from functionalized monomer depicted in Figure 3(b) will hydrolyze faster than the one derived from



functionalized monomer depicted in Figure 3(c) and 1(e). This is attributed to the higher number of glycolic acid based repeat units in the main chain of the polymer depicted in figure 3(a) in contrast to the polymers depicted in figure 3(b) and 3(c). Similarly, the hydrolytic degradation rates of these polymers can also be varied by varying the safe and biocompatible molecule that is used to functionalize the amino acid. For example, polymer derived from caprolactone-functionalized amino acid will hydrolyze at a much slower rate than the polymer derived from glycolic acid functionalized amino acid. Furthermore, variation in the chain length of diols used to synthesize these polymers will also enable us to vary the hydrolytic degradation rates of the polymers.

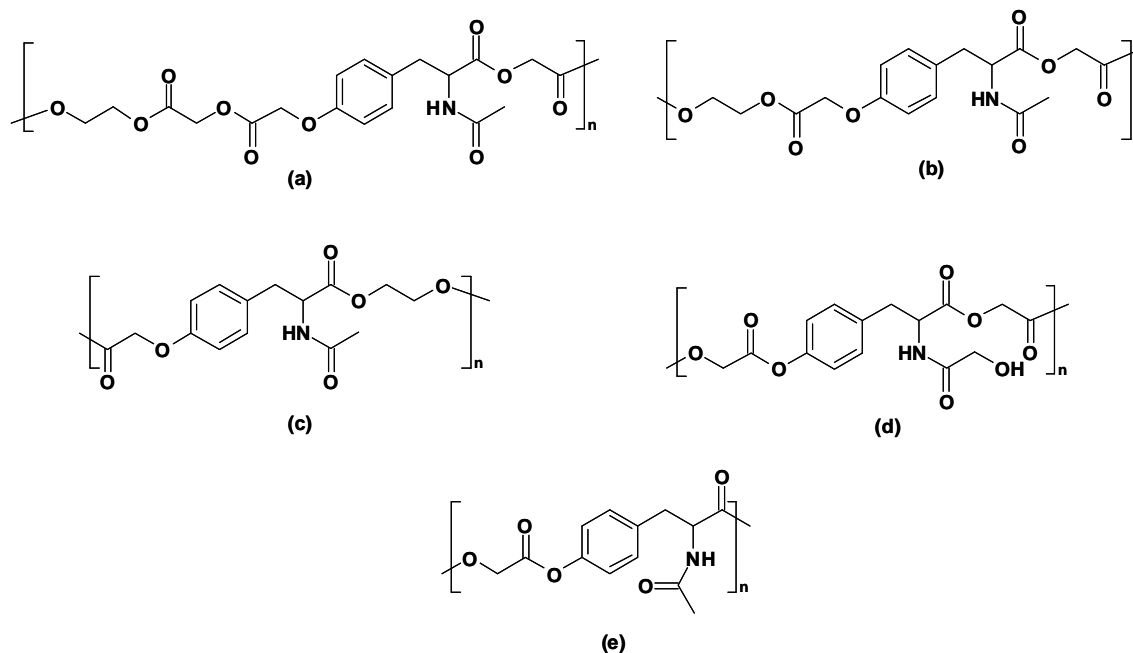


Figure 3 Selected examples of functionalized Tyrosine monomers with varying hydrolytic degradation rates

These polymers can be used in various biomedical applications such as controlled drug delivery, tunable release of biologically active compounds and antimicrobial agents, wound healing and closure and tissue engineering.

3.0 Summary

- At Bezwada Biomedical, we have developed a number of functionalized amino acid monomers including functionalized Tyrosine and Lysine. They were prepared by functionalization of amino acids with safe and biocompatible molecules such as glycolic acid, lactic acid, caprolactone and p-dioxanone.



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- These functionalized amino acid monomers and polymers therefrom have different as well as tunable hydrolytic degradation profiles.
- These hydrolysable functionalized amino acid monomers will find use in the preparation of a number of linear or branched absorbable polymers with potential applications in controlled delivery of drugs and bioactive agents; wound healing, adhesion prevention barriers, stents and stent coatings and sutures.

Contact Us

For further information on how we can help you engineer your success, please contact us at info@bezwadabiomedical.com or visit us at www.bezwadabiomedical.com

References:

1. Bezwada, Rao S., US Patent Application No. 20090098180.
2. Bezwada, Rao S., US Patent Application No. 20080057127
3. Bezwada, Rao S., PCT Patent Application No. WO 2007047244A2

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Functionalized Amino Acid Monomers for Biomedical and Cosmetic Applications

Bezwada Biomedical is pleased to offer a series of new hydrolysable functionalized amino acid monomers including functionalized Tyrosine and Lysine monomers and absorbable polymers prepared from these monomers. These monomers and polymers are for research purposes only. In case you need larger quantities or custom synthesis or you do not see a functionalized amino acid that you need for your research, please contact us at 908-281-7529 or email us at info@bezwadabiomedical.com. Your suggestions are welcome and appreciated.



GENERAL INFORMATION

How to order:

To place an order, please write or fax to:

Bezwada Biomedical LLC
15 Ilene Court , Suite 1
Hillsborough, NJ 08844 U.S.A.

Telephone: (908) 281-7529
e-mail: info@bezwadabiomedical.com

Fax: (908) 359-1179

Specify the chemical name, the catalog number, the quantity and your purchase order number.

Terms and conditions of sale:

Terms are F.O.B. Hillsborough, New Jersey. Net 10 days. Prices shown are in U.S. dollars and are subject to change. All orders are insured at the buyers' expense. Applicable taxes and shipping charges will be added to the invoice.

Discounting information:

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Some of the chemicals listed may be toxic or otherwise hazardous, and they should be handled by qualified individuals trained in laboratory procedures. The information and data given in this catalog are correct to the best of our knowledge, but their accuracy is not guaranteed. Bezwada Biomedical LLC, will not be responsible for any loss or damage involving the use of our chemicals or products beyond the purchase price.

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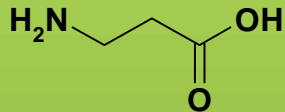
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Period of delivery will be given upon receipt of an inquiry or order.

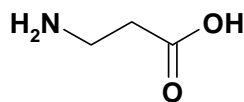


Alanine

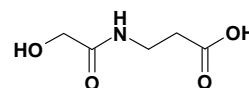


Alanine, or L-alanine is one of the non-essential amino acid. It is abundant in human muscle tissue. It helps in conversion of sugar glucose into energy in the body. It also helps in eliminating excess toxins from the liver. By means of Alanine cycle in the body, it plays a critical role in maintaining balanced levels of nitrogen and glucose in the body. Furthermore, it may help to regulate blood sugar as well while enhancing the immune system by producing the antibodies. In addition, alanine is also found in the prostate fluid and may play important role in maintaining the prostate health.

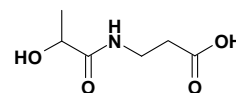
Good sources of alanine include meat, poultry, eggs, dairy products, and fish. Some protein-rich plant foods like avocado are also good sources of Alanine

Functionalized Alanine**Alanine****19-1455****3-(2-Hydroxy-acetylamino)-propionic acid**C₅H₉NO₄

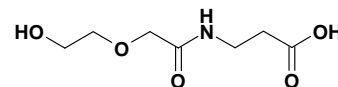
MW 147.13

**19-1456****3-(2-Hydroxy-propionylamino)-propionic acid**C₆H₁₁NO₄

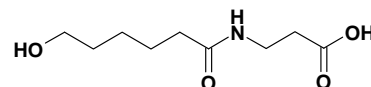
MW 161.16

**19-1457****3-[2-(2-Hydroxy-ethoxy)-acetylamino]-propionic acid**C₇H₁₃NO₅

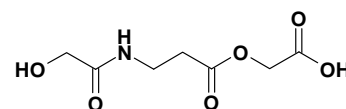
MW 191.19

**19-1458****3-(6-Hydroxy-hexanoylamino)-propionic acid**C₉H₁₇NO₄

MW 203.24

**19-1459****3-(2-Hydroxy-acetylamino)-propionic acid
carboxymethyl ester**C₇H₁₁NO₆

MW 205.17



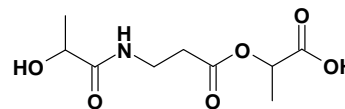


19-1460 3-(2-Hydroxy-propionylamino)-propionic acid 1-carboxy

Ethyl ester

$C_9H_{15}NO_6$

MW 233.22

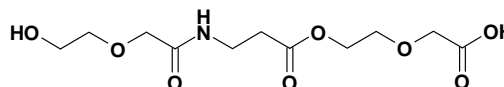


19-1461 3-[2-(2-Hydroxy-ethoxy)-acetyl-amino]-propionic acid

2-carboxymethoxy-ethyl ester

$C_{11}H_{19}NO_8$

MW 293.28

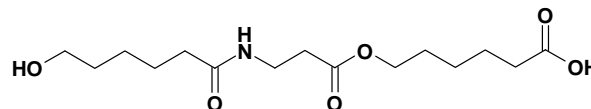


19-1462

6-[3-(6-Hydroxy-hexanoylamino)-propionyloxy]-hexanoic acid

$C_{15}H_{27}NO_6$

MW 317.39

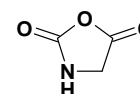


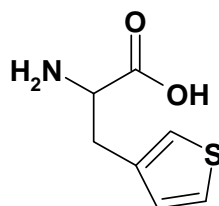
19-1463 (Alanine N-Carboxyanhydride)

Ozazolidine-2,5-dione

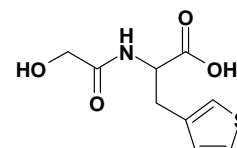
$C_3H_3NO_3$

101.06

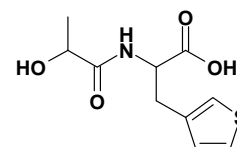


Functionalized β -(2-Thienyl)alanine **β -(2-Thienyl)alanine**

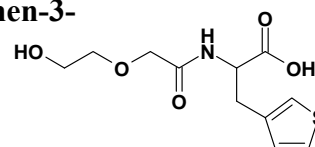
19-1645 **2-(2-Hydroxy-acetylamino)-3-thiophen-3-yl-propionic acid**
 $C_9H_{11}NO_4S$
229.26



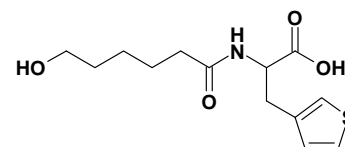
19-1646 **2-(2-Hydroxy-propionylamino)-3-thiophen-3-yl-propionic acid**
 $C_{10}H_{13}NO_4S$
243.28



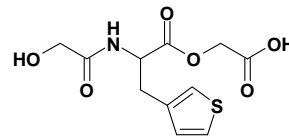
19-1647 **2-[2-(2-Hydroxy-ethoxy)acetylamino]-3-thiophen-3-yl-propionic acid**
 $C_{11}H_{15}NO_5S$
273.31



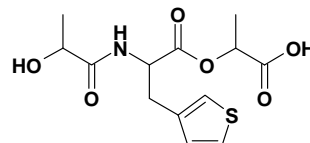
19-1648 **2-(6-Hydroxy-hexanoylamino)-3-thiophen-3-yl-propionic acid**
 $C_{13}H_{19}NO_4S$
285.36



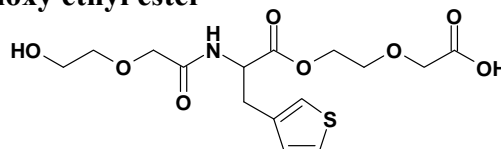
19-1649 **2-(2-Hydroxy-acetylamino)-3-thiophen-3-yl-propionic acid
carboxymethyl ester**
C₁₁H₁₃NO₆S
287.29



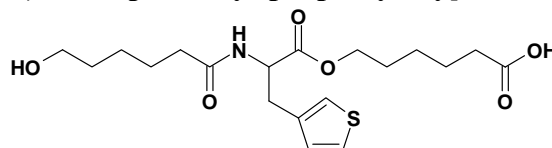
19-1650 **2-(2-Hydroxy-ropionylamino)-3-thiophen-3-yl-propionic acid
1-carboxy ethyl ester**
C₁₃H₁₇NO₆S
315.35



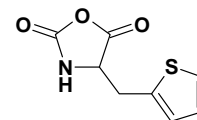
19-1651 **2-[2-(2-Hydroxy-ethoxy)-acetylamino]-3-thiophen
-3-yl-propionic acid 2-carboxymethoxy ethyl ester**
C₁₅H₂₁NO₈S
375.40



19-1652 **6-[2-(6-Hydroxy-hexanoylamino)-3-thiophen-3-yl-propionyloxy]
-hexanoic acid**
C₁₉H₂₉NO₆S
399.51

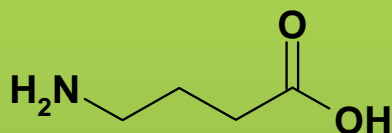


19-1653 **β-(2-Thielalanine N-Carboxyanhydride)
4-Thiophen-2-ylmethyl-oxazolidine-2,5-dione**
C₈H₇NO₃S
197.21



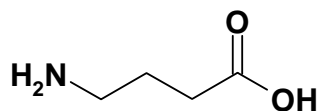
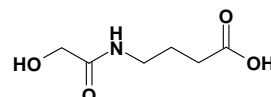
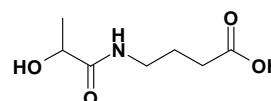
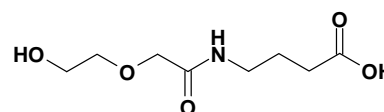
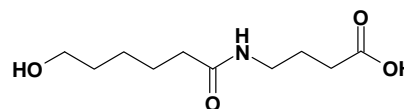
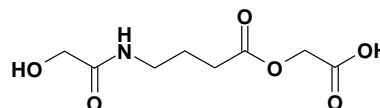


4-Amino Butyric acid



4-Amino butyric acid, or Gamma amino butyric acid (GABA), is one of the non-essential amino acid. It plays an important role as an inhibitory neurotransmitter in central nervous system and helps regulate neuronal excitability throughout the nervous system. Hence it serves as a natural tranquilizer. Furthermore, it regulates the sleep cycle and stabilizes the blood pressure. Moreover, it is responsible for regulation of muscle tone. In addition, it also regulates the release of growth hormone from the pituitary gland.

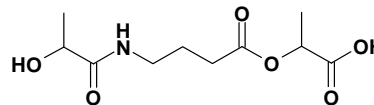
GABA supplements are a very effective analgesic agents which help in reducing pain from chronic conditions. They may also lessen pain-related nerve impulses.

Functionalized 4-Aminobutyric acid**4-Aminobutyric acid****19-1473 4-(2-Hydroxy-acetylamino)-butyric acid**C₆H₁₁NO₄
MW 161.16**19-1474 4-(2-Hydroxy-propionylamino)-butyric acid**C₇H₁₃NO₄
MW 175.19**19-1475 4-[2-(2-Hydroxy-ethoxy)-acerylamino]-butyric acid**C₈H₁₅NO₅
MW 205.21**19-1476 4-(6-Hydroxy-hexanoylamino)-butyric acid**C₁₀H₁₉NO₄
MW 217.27**19-1477 4-(2-Hydroxy-acetylamino)-butyric acid carboxymethyl ester**C₈H₁₃NO₆
MW 219.20



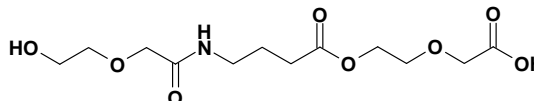
19-1478 4-(2-Hydroxy-propionylamino)-butyric acid
1-carboxy-ethyl ester

$C_{10}H_{17}NO_6$
MW 247.25



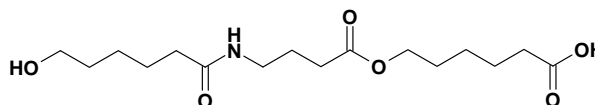
19-1479 4-[2-(2-Hydroxy-etoxy)-acetylamino]-
Butyric acid 2-carboxymethoxy-ethyl ester

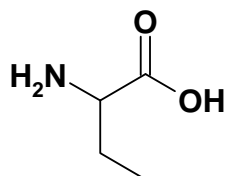
$C_{12}H_{21}NO_8$
MW 307.3



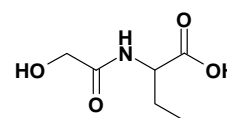
19-1480 6-[4-(6-Hydroxy-hexanoylamino)-butyryloxy]
-hexanoic acid

$C_{16}H_{29}NO_6$
MW 331.41

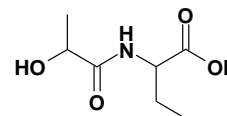


Functionalized 2-Aminobutyric acid**2-Aminobutyric acid****19-1464 2-(2-Hydroxy-acetylamino)-butyric acid**

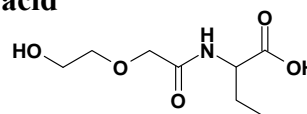
$C_6H_{11}NO_4$
MW 161.16

**19-1465 2-(2-Hydroxy-propionylamino)-butyric acid**

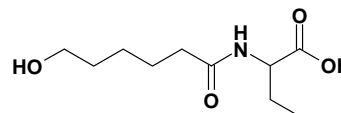
$C_7H_{13}NO_4$
MW 175.19

**19-1466 2-[2-(2-Hydroxy-ethoxy)-acetylamino]-butyric acid**

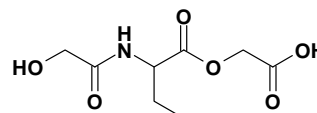
$C_8H_{15}NO_5$
MW 205.21

**19-1467 2-(6-Hydroxy-hexanoylamino)-butyric acid**

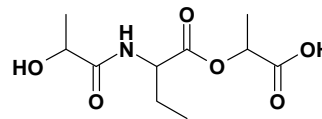
$C_{10}H_{19}NO_4$
MW 217.27

**19-1468 2-(2-Hydroxy-acetylamino)-butyric acid carboxy methyl ester**

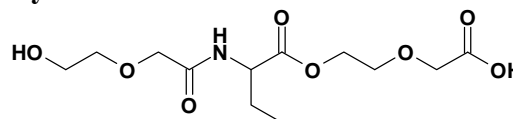
$C_8H_{13}NO_6$
MW 219.20



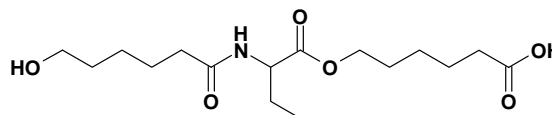
19-1469 **2-(2-Hydroxypropionylamino)-butyric acid 1-carboxy ethylester**
C₁₀H₁₇NO₆
MW 247.25



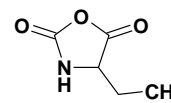
19-1470 **2-(2-(2-Hydroxy-ethoxy)-acetylamino)-Butyric acid 2-carboxymethoxy ethyl ester**
C₁₂H₂₁NO₈
MW 307.30

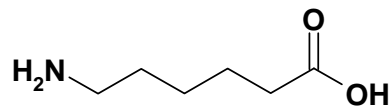
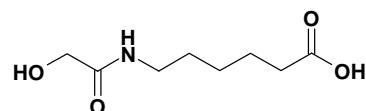
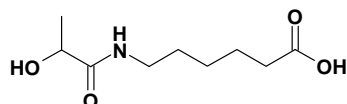
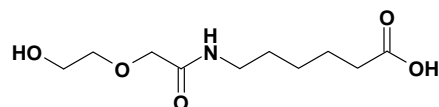
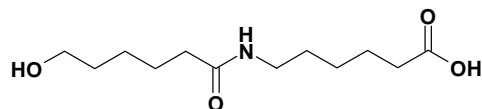
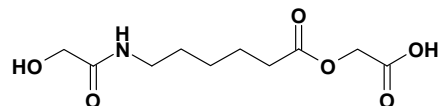


19-1471 **6-[2-(6-Hydroxy-hexanoylamino)-butyryloxy]-hexanoic acid**
C₁₆H₂₉NO₆
MW 331.41



19-1472 **(2-Aminobutyric acid N-Carboxyanhydride)
4-Ethyl-oxazolidine-2,5-dione**
C₅H₇NO₃
129.12

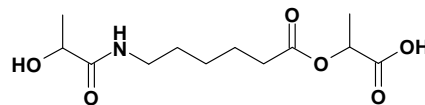


Functionalized 6-Aminobutyric acid**6-Aminobutyric acid****19-1481 6-(2-Hydroxy-acetyl-amino)-hexanoic acid**C₈H₁₅NO₄
MW 189.21**19-1482 6-(2-Hydroxy-propionyl-amino)-Hexanoic acid**C₉H₁₇NO₄
MW 203.04**19-1483 6-[2-(2-Hydroxy-ethoxy)-acetyl-amino]-hexanoic acid**C₁₀H₁₉NO₅
MW 233.27**19-1484 6-(6-Hydroxy-hexanoyl-amino)-hexanoic acid**C₁₂H₂₃NO₄
MW 245.32**19-1485 6-(2-Hydroxy-acetyl-amino)-hexanoic acid carboxymethyl ester**C₁₀H₁₇NO₆
MW 247.25



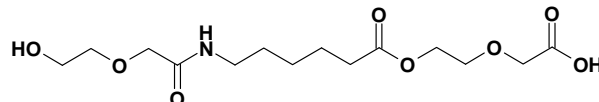
19-1486 6-(2-Hydroxy-propionylamino)-hexanoic acid 1-carboxy ethyl ester

$C_{12}H_{21}NO_6$
MW 275.30



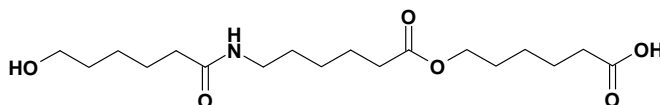
19-1487 6-[2-(2-Hydroxy-ethoxy)-acetylamino]-hexanoic acid 2-carboxymethoxy ethyl ester

$C_{14}H_{25}NO_8$
MW 335.36



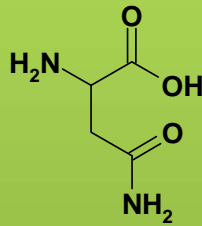
19-1488 6-(6-Hydroxy-hexanoylamino)-hexanoic acid 5-carboxy pentyl ester

$C_{18}H_{33}NO_6$
MW 359.47





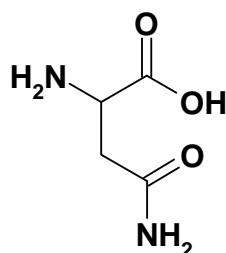
Asparagine



Asparagine is a non-essential basic amino acid. It is involved in transportation of nitrogen. In addition it helps in the regulation of brain and nerve function in the body. In addition, it plays important role in metabolism of toxic ammonia in the body. It has vital effect on nerve and brain health.

Good sources of asparagine include meat, poultry, eggs, dairy products, and fish. Some plant foods such as asparagus, potatoes, legumes are also good sources of Asparagine.

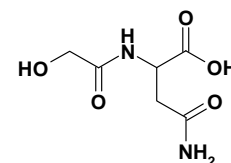
Functionalized Asparagine



Asparagine

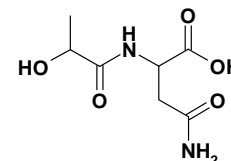
19-1489 **2-(2-Hydroxy-acetyl-amino)-Succinamic acid**

$C_6H_{10}N_2O_5$
MW 190.16



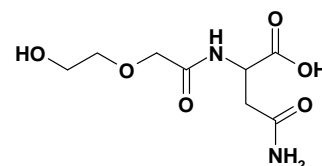
19-1490 **2-(2-Hydroxy-propionyl-amino)-succinamic acid**

$C_7H_{12}N_2O_5$
MW 204.18



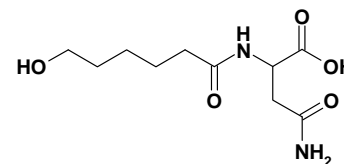
19-1491 **2-[2-(2-Hydroxy-ethoxy)-acetyl-amino]-succinamic acid**

$C_8H_{14}N_2O_6$
MW 234.21



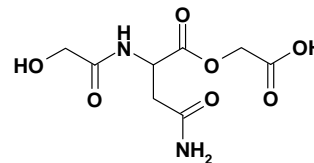
19-1492 **2-(6-Hydroxy-hexanoylamino)-succinamic acid**

$C_{10}H_{18}N_2O_5$
MW 246.27

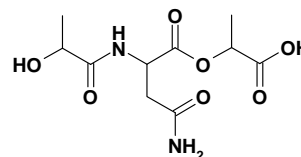


19-1493 2-(2-Hydroxy-acetylamino)-succinamic acid carboxymethyl ester

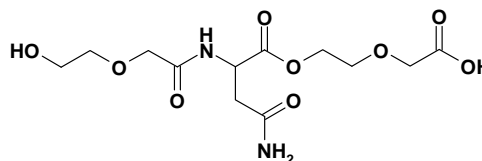
$C_8H_{12}N_2O_7$
MW 248.19

**19-1494 2-(2-Hydroxy-propionylamino)-succinamic acid 1-carboxy ethyl ester**

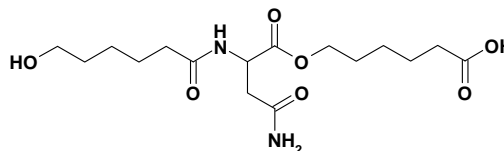
$C_8H_{16}N_2O_7$
MW 276.25

**19-1495 2-[2-(2-Hydroxy-ethoxy)-acetylamino]-succinamic acid 2-carboxymethoxy ethyl ester**

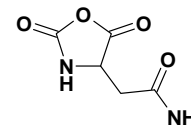
$C_{12}H_{20}N_2O_9$
MW 336.30

**19-1496 6-[3-Carbamoyl-2-(6-hydroxy-hexanoylamino)-propionyloxy]-hexanoic amino acid**

$C_{16}H_{28}N_2O_7$
MW 360.41

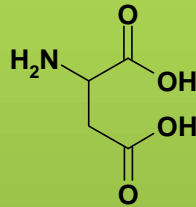
**19-1505 (Asparagine N-Carboxyanhydride) 4,4-Dimethyl-oxazolidine-2,5-dione**

$C_5H_7NO_3$
129.12

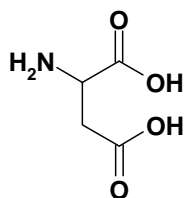




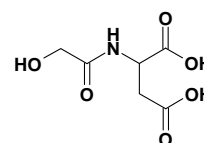
Aspartic Acid



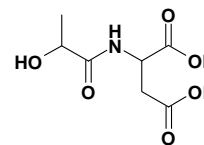
Aspartic acid is a non-essential amino acid. It plays a key role in promoting robust metabolism and generating cellular energy. Furthermore, it is also the precursor for other amino acids such as Lysine, methionine, threonine and isoleucine along with a number of nucleotides. It also help strengthen the immune system by promoting increased production of immunoglobulins and antibodies. It also helps transport nutrients needed to form healthy RNA and DNA to the cells. Moreover, it also helps in developing and maintaining a healthy nervous system by promoting the secretion of neurotransmitters. In addition, it stimulates normal cell growth and participates in the synthesis of glucose.

Functionalized Aspartic acid**Aspartic acid**

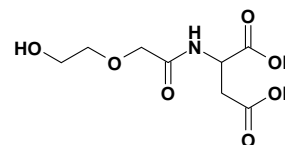
19-1497 **2-(2-Hydroxy-acetylamino)-succinic acid**
C₆H₉NO₆
MW 191.14



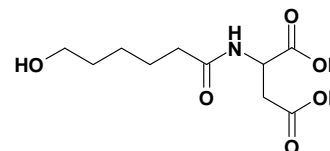
19-1498 **2-(2-Hydroxy-propionylamino)-succinic acid**
C₇H₁₁NO₆
MW 205.17



19-1499 **2-[2-(2-Hydroxy-ethoxy)-acetylamino]-succinic acid**
C₈H₁₃NO₇
MW 235.20



19-1500 **2-(6-Hydroxy-hexanoylamino)-succinic acid**
C₁₀H₁₇NO₆
MW 247.25

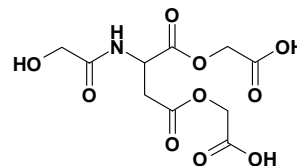




19-1501 2-(2-Hydroxy-acetylamino)-succinic acid dicarboxymethyl ester

$C_{10}H_{13}NO_{10}$

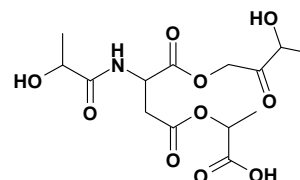
307.22



19-1502 2-(2-Hydroxy-propionylamino)-succinic acid 4-(1-carboxy-ethyl) ester 1-(3-hydroxy-2-oxo-butyl) ester

$C_{14}H_{21}NO_{10}$

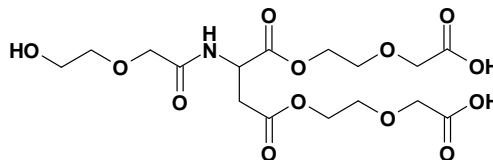
363.32



19-1503 2-[2-(2-Hydroxy-ethoxy)-acetylamino]-succinic acid bis-(2-carboxymethoxy-ethyl) ester

$C_{16}H_{25}NO_{13}$

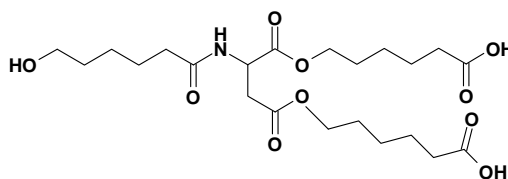
439.38



19-1504 2-(6-Hydroxy-hexanoylmino)-succinic acid bis-(5-carboxy-pentyl) ester

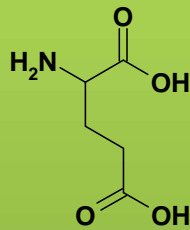
$C_{22}H_{37}NO_{10}$

475.54





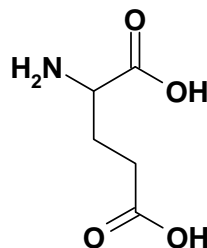
Glutamic Acid



Glutamic acid is the most abundant non-essential amino acid in the body. It plays a important role in metabolism of fat and sugar. It also plays a significant role in normal functioning of heart and prostate. Furthermore, it plays a key role in transportation of potassium across the blood brain barrier. Moreover, it is also a major excitatory neurotransmitter in the brain and spinal cord and helps in normal nervous system function. Furthermore, it is also important in metabolism of fat and sugar.

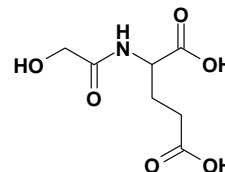


Functionalized Glutamic acid

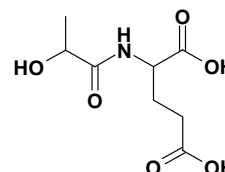


Glutamic acid

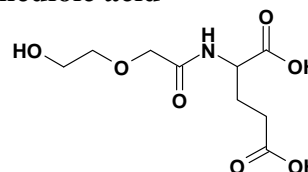
19-1551 **2-(2-Hydroxy-acetylamino)-pentanedioic acid**
C₇H₁₁NO₆
MW 205.17



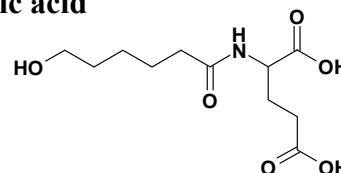
19-1552 **2-(2-Hydroxy-propionylamino)-pentanedioic acid**
C₈H₁₁NO₆
MW 219.20



19-1553 **2-[2-(2-Hydroxy-ethoxy)-acetylamino]-pentanedioic acid**
C₉H₁₅NO₇
MW 249.22

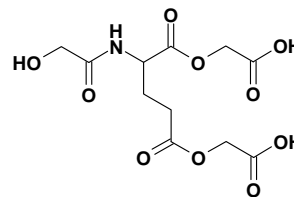


19-1554 **2-(6-Hydroxy-hexanoylamino)-pentanedioic acid**
C₁₁H₁₉NO₆
MW 261.28

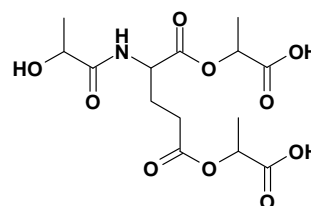


19-1555 2-(2-Hydroxy-acetylamino)-pentanedioic acid dicarboxymethyl ester

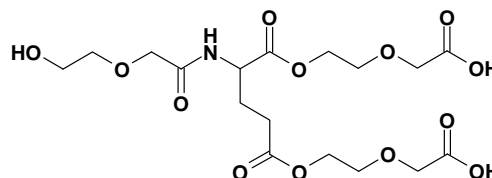
$C_{11}H_{15}NO_{10}$
321.24

**19-1556 2-(2-Hydroxy-propionylamino)-pentanedioic acid bis-(1-carboxy-ethyl) ester**

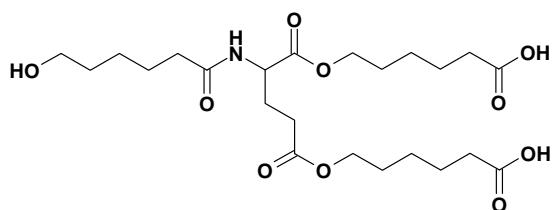
$C_{14}H_{21}NO_{10}$
363.32

**19-1557 2-[2-(2-Hydroxy-ethoxy)acetylamino]-pentanedioic Acid bis-(2-carboxymethoxy-ethyl) ester**

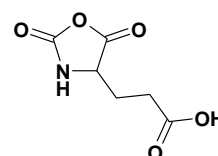
$C_{17}H_{27}NO_{13}$
453.40

**19-1558 2-(6-Hydroxy-hexanoylamino)-pentanedioic acid Bis-(5-carboxy-pentyl) ester**

$C_{23}H_{39}NO_{10}$
489.57

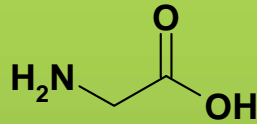
**19-1680 3-(2,5-Dioxo-oxazolidin-4-yl)-propionic acid**

$C_6H_7NO_5$
173.13





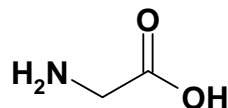
Glycine



Glycine is the simplest non-essential amino acid. It is used to help create muscle tissue and convert glucose into energy. It also helps prevent breakdown of muscle by boosting the body's levels of creatine, a compound that helps build muscle mass. It is also essential to maintaining digestive systems by regulating the synthesis of bile acid which is used to digest fats. It also helps regulate blood sugar levels and helps maintain healthy central nervous system by inhibiting the neurotransmitter that causes brain disorders.

Good sources of glycine include fish, meat, beans, milk, and cheese.

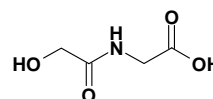
Functionalized Glycine



Glycine

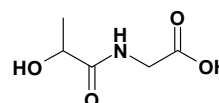
19-1559 (2-Hydroxy-acetylamino)-acetic acid

C₄H₇NO₄
MW 133.10



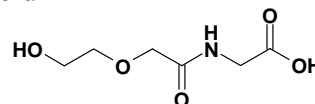
19-1560 (2-Hydroxy-propionylamino)-acetic acid

C₅H₉NO₄
MW 147.13



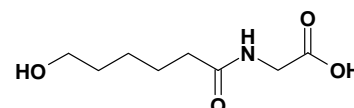
19-1561 [2-(2-Hydroxy-ethoxy)-acetylamino]-acetic acid

C₆H₁₁NO₅
MW 177.16



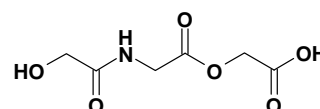
19-1562 (6-Hydroxy-hexanoylamino)-acetic acid

C₈H₁₅NO₄
MW 189.21



19-1563 (2-Hydroxy-acetylamino)-acetic acid carboxymethyl ester

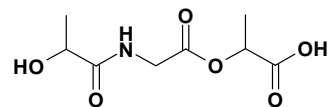
C₆H₉NO₆
MW 191.14





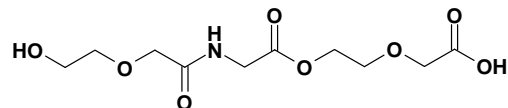
19-1564 2-[2-(2-Hydroxy-propionylamino)-acetoxy]-propionic acid

$C_8H_{13}NO_6$
MW 219.20



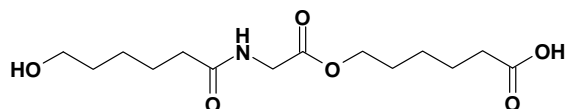
**19-1565 (2-{2-[2-(2-Hydroxy-ethoxy)-acetylamino]-ethoxy})
acetic acid**

$C_{10}H_{17}NO_8$
MW 279.25

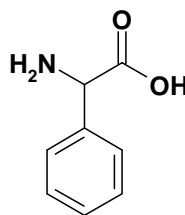


**19-1566 6-[2-(6-Hydroxy-hexanoylamino)-acetoxy]-
hexanoic acid**

$C_{14}H_{25}NO_6$
MW 303.36

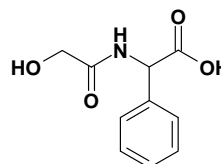


Functionalized Phenylglycine

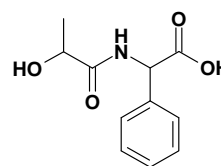


Phenylglycine

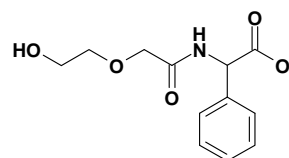
19-1628 **(2-Hydroxy-acetylamino)-phenyl-acetic acid**
C₁₀H₁₁NO₄
209.20



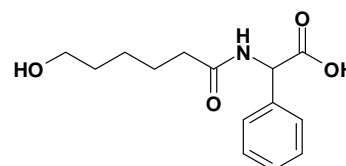
19-1629 **(2-Hydroxy-propionylamino)-phenyl-acetic acid**
C₁₁H₁₃NO₄
223.23



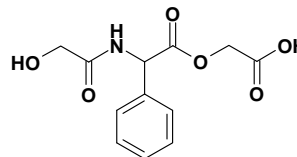
19-1630 **[2-(2-Hydroxy-ethoxy)-acetylamino]-phenyl acetic acid**
C₁₂H₁₅NO₅
253.26



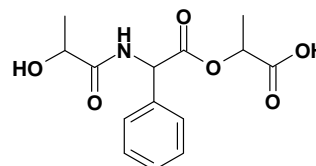
19-1631 **(6-Hydroxy-hexanoylamino)-phenyl-acetic acid**
C₁₄H₁₉NO₄
265.31



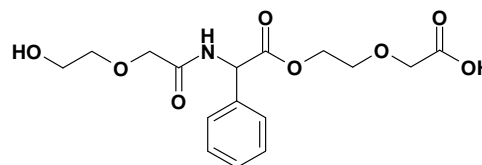
19-1632 (2-Hydroxy-acetylamino)-phenyl-acetic acid carboxymethyl ester
 $C_{12}H_{13}NO_6$
267.24



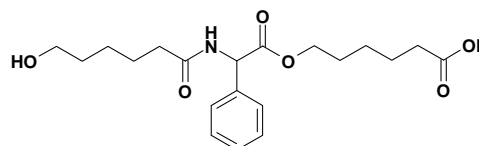
19-1633 2-[2-(2-Hydroxy-propionylamino)-2-phenyl-acetoxy]-propionic acid
 $C_{14}H_{17}NO_6$
295.29



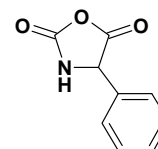
19-1634 [2-(2-Hydroxy-ethoxy)-acetylamino]-phenyl acetic acid 2-carboxymethoxy-ethyl ester
 $C_{16}H_{21}NO_8$
355.35



19-1635 6-[2-(6-Hydroxy-hexanoylamino)-2-phenyl-acetoxy]-hexanoic acid
 $C_{20}H_{29}NO_6$
379.46

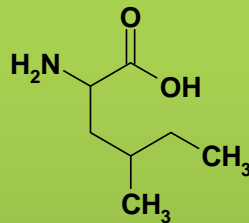


19-1636 (Phenylglycine N-Carboxyanhydride) 4-Phenyl-oxazolidine-2,5-dione
 $C_9H_7NO_3$
177.17





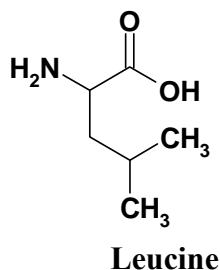
IsoLeucine



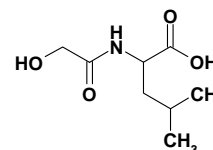
Isoleucine is an essential alpha amino acid. It is essential for the formation of hemoglobin. It also helps in regulation of blood sugar levels and generation of energy. Isoleucine along with some other amino acid can be used for muscle building as it prevents the breakdown of protein during exercise. Isoleucine may prevent muscle wasting and help in tissue repair. Hence, it is especially important for athletes and body builders as it boosts energy and help promote muscle recovery in the body after strenuous physical activity.

Good sources of isoleucine include high-protein foods, such as nuts, seeds, meat, eggs, fish, lentils, peas, and soy protein.

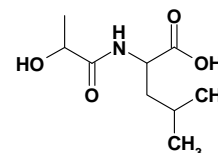
Functionalized Leucine



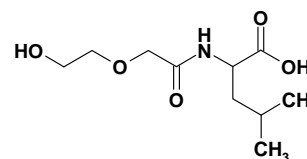
19-1576 **2-(2-Hydroxy-acetylamino)-4-methyl-pentanoic acid**
C₈H₁₅NO₄
MW 189.21



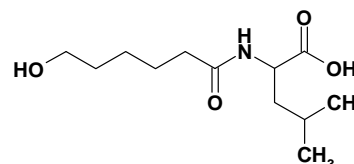
19-1577 **2-(2-Hydroxypropionylamino)-4-methyl-pentanoic acid**
C₉H₁₇NO₄
MW 203.24



19-1578 **2-[2-(2-Hydroxy-ethoxy)-acetylamino]-4-methyl pentanoic acid**
C₁₀H₁₉NO₅
MW 233.27

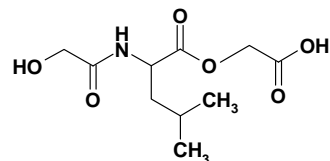


19-1579 **2-(6-Hydroxy-hexanoylamino)-4-methyl-pentanoic acid**
C₁₂H₂₃NO₄
MW 245.32

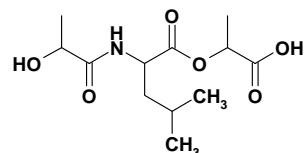


19-1580 2-(2-Hydroxy-propionylamino)-4-methyl-pentanoic acid 1-carboxy ethyl ester

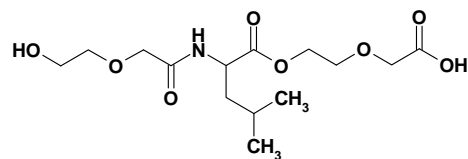
$C_{12}H_{21}NO_6$
MW 275.30

**19-1826 2-(2-(2-hydroxypropanamido)-4-methylpentanoyloxy)propanoic acid**

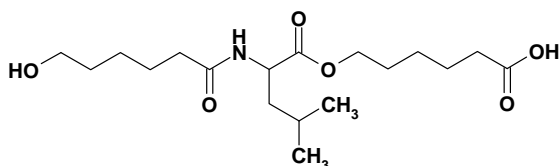
$C_{12}H_{21}NO_6$
275.30

**19-1581 2-[2-(2-Hydroxy-ethoxy)-acetyl-amino]-4-methyl-pentanoic acid 2-carboxymethoxy-ethyl ester**

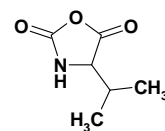
$C_{14}H_{25}NO_8$
MW 335.36

**19-1582 6-[2-(6-Hydroxy-hexanoylamino)-4-methyl-pentanoyloxy] hexanoic acid**

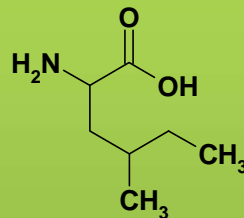
$C_{18}H_{33}NO_6$
MW 359.47

**19-1583 (Leucine N-Carboxyanhydride)**

$C_6H_9NO_3$
143.14

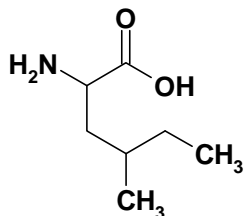


Isoleucine

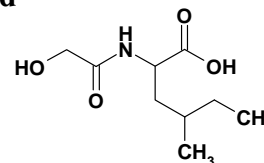


Isoleucine is an essential alpha amino acid. It is essential for the formation of hemoglobin. It also helps in regulation of blood sugar levels and generation of energy. Isoleucine along with some other amino acid can be used for muscle building as it prevents the breakdown of protein during exercise. Isoleucine may prevent muscle wasting and help in tissue repair. Hence, it is especially important for athletes and body builders as it boosts energy and help promote muscle recovery in the body after strenuous physical activity.

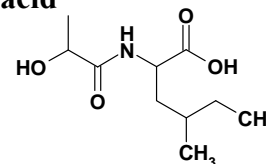
Good sources of isoleucine include high-protein foods, such as nuts, seeds, meat, eggs, fish, lentils, peas, and soy protein.

Functionalized Isoleucine**Isoleucine****19-1567 2-(2-Hydroxy-acetyl-amino)-4-methyl-hexanoic acid**

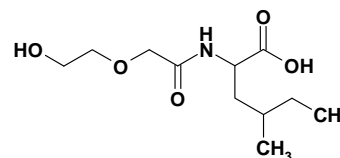
C₉H₁₇NO₄
MW 203.24

**19-1568 2-(2-Hydroxy-propionyl-amino)-4-methyl-hexanoic acid**

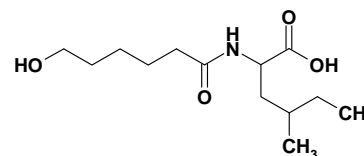
C₁₀H₁₉NO₄
MW 217.27

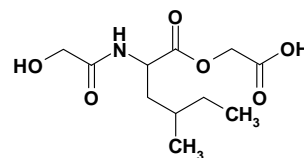
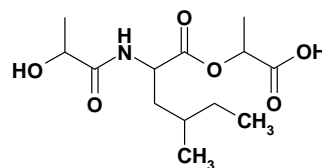
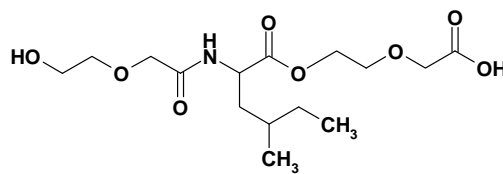
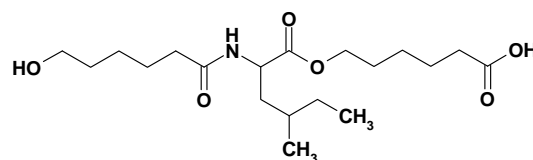
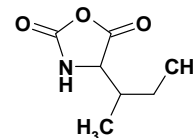
**19-1569 2-[2-(2-Hydroxy-ethoxy)-acetyl-amino]-4-methyl hexanoic acid**

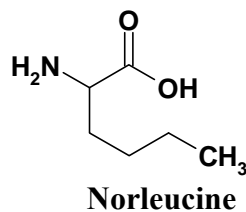
C₁₁H₂₁NO₅
MW 247.29

**19-1570 2-(6-Hydroxy-hexanoylamino)-4-methyl-hexanoic acid**

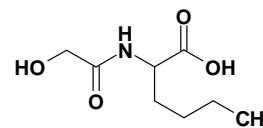
C₁₃H₂₅NO₄
MW 259.35



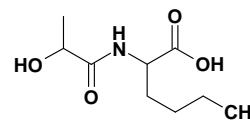
19-1571 **2-(2-Hydroxy-acetylamino)-4-methyl-hexanoic acid
carboxymethyl ester**C₁₁H₁₉NO₆
MW 261.28**19-1572** **2-(2-Hydroxy-propionylamino)-4-methyl-hexanoic acid
1-carboxy ethyl ester**C₁₃H₂₃NO₆
MW 289.33**19-1573** **2-[2-(2-Hydroxy-ethoxy)-acetylamino]-4-methyl-hexanoic acid
2-carboxymethoxy-ethyl ester**C₁₅H₂₇NO₈
MW 349.38**19-1574** **2-(6-Hydroxy-hexanoylamino)-4-methyl-hexanoic acid 5-carboxy
pentyl ester**5-carboxy
C₁₉H₃₅NO₆
MW 373.4**19-1575** **(Isoleucine N-Carboxyanhydride)
4-Sec-butyl-oxazolidine-2,5-dione**C₇H₁₁NO₃
157.17

Functionalized Norleucine

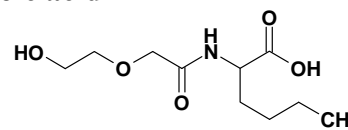
19-1593 **2-(2-Hydroxy-acetylamino)-hexanoic acid**
C₈H₁₅NO₄
MW 189.21



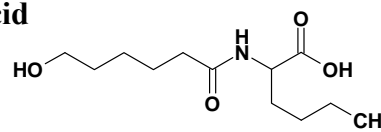
19-1594 **2-(2-Hydroxy-propionylamino)-hexanoic acid**
C₉H₁₇NO₄
MW 203.24



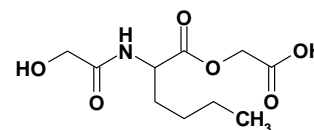
19-1595 **2-[2-(2-Hydroxy-ethoxy)-acetylamino]-hexanoic acid**
C₁₀H₁₉NO₅
MW 233.27



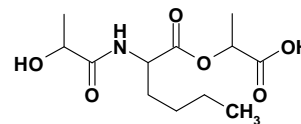
19-1596 **2-(6-Hydroxy-hexanoylamino)-hexanoic acid**
C₁₂H₂₃NO₄
MW 245.32



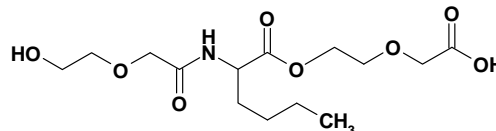
19-1597 **2-(2-Hydroxy-acetylamino)-hexanoic acid carboxymethyl ester**
C₁₀H₁₇NO₆
247.25



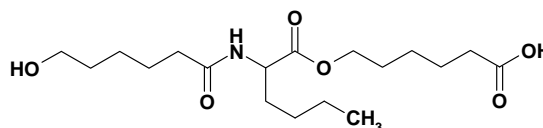
19-1598 **2-(2-Hydroxy-propionylamino)-hexanoic acid 1-carboxy ethyl ester**
 $C_{12}H_{21}NO_6$
275.30



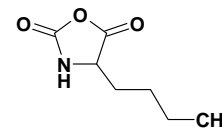
19-1599 **7-Butyl-1-hydroxy-5,8-dioxo-3,9,12-trioxa-6-azatetradecan-14-oic acid**
 $C_{14}H_{25}NO_8$
335.36



19-1600 **2-(6-Hydroxy-hexanoylamino)-hexanoic acid 5-carboxy pentyl ester**
 $C_{18}H_{33}NO_6$
359.47

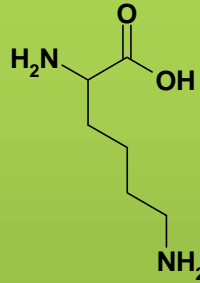


19-1601 **(Norleucine N-Carboxyanhydride)**
4-Butyl-oxazolidine-2,5-dione
 $C_7H_{11}NO_3$
157.17





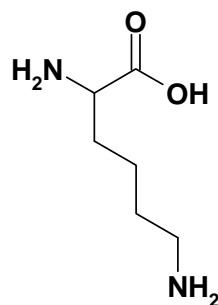
Lysine



Lysine is an essential amino acid. It is involved in collagen formation and plays a crucial role in proper absorption of calcium from the gastrointestinal tract. It may also be used in prevention of osteoporosis. Hence it helps in the growth and maintenance of bones in both children and adults. Beside this, lysine is also used for curing herpes virus induced infections and also helps the immune system to produce antibodies. In addition, it helps accelerate post surgical recovery as well as recovery from injury.

Good sources of lysine includes cheese, eggs, fish, lima beans, milk, potatoes, red meat, soy products, and yeast.

Functionalized Lysine



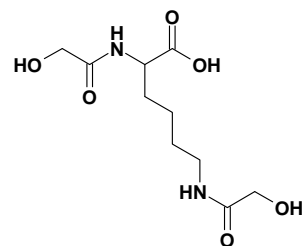
Lysine

19-1672

2,6-Bis-(2-hydroxy-acetylamino)-hexanoic acid

262.26

$C_{10}H_{13}N_2O_6$

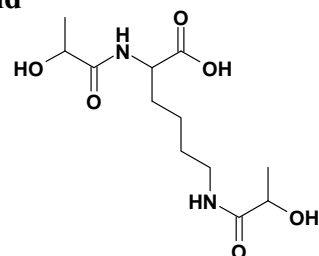


19-1673

2,6-Bis-(2-Hydroxy-propionylamino)-hexanoic acid

$C_{12}H_{22}N_2O_6$

290.32

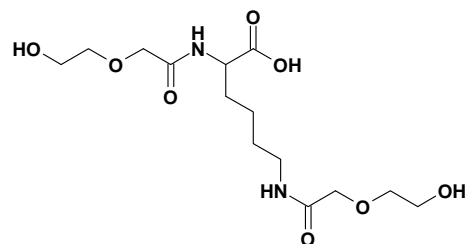


19-1674

2,6-Bis-[2-(2-hydroxy-ethoxy)-acetylamino]-hexanoic acid

$C_{14}H_{26}N_2O_8$

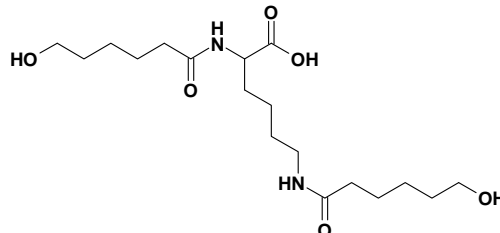
350.37



19-1675

2,6-Bis-(6-hydroxy-hexanoylamino)-hexanoic acid $C_{18}H_{34}N_2O_6$

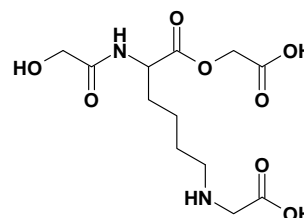
374.48



19-1676

6-(Carboxymethyl-amino)-2-(2-hydroxy-acetylamino)-Hexanoic acid**Carboxymethyl ester** $C_{12}H_{20}N_2O_8$

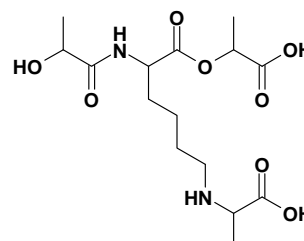
320.30



19-1677

6-(1-Carboxy-ethylamino)-2-(2-hydroxy-propionylamino)-hexanoic acid**1-carboxy-ethyl ester** $C_{15}H_{26}N_2O_8$

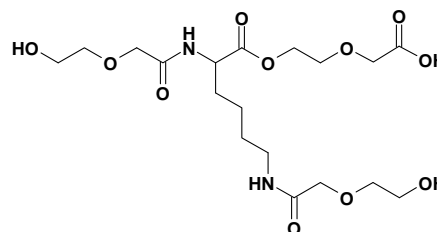
362.38



19-1678

2,6-Bis-[2-(2-hydroxy-ethoxy)-acetylamino]-hexanoic acid**2-Carboxymethoxy-ethyl ester** $C_{18}H_{32}N_2O_{11}$

452.46

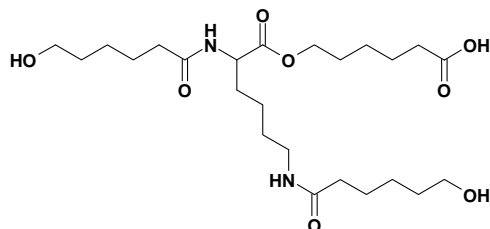




19-1679

**2,6-Bis-(6-hydroxy-hexanoylamino)-hexanoic acid
5-carboxy pentyl ester**

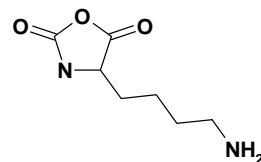
$C_{24}H_{44}N_2O_8$
488.63



19-1681

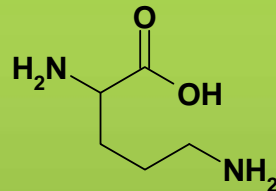
4-(4-Amino-butyl)-oxazolidine-2,5-dione

$C_7H_{12}N_2O_3$
172.19





Ornithine

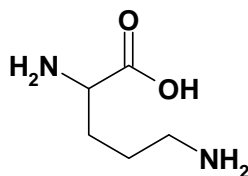


Ornithine is a non-essential amino acid. It is produced in the body via breakdown of arginine during the citric acid cycle. It helps build muscle and reduce body fat, especially in combination with arginine and carnitine. It is also a precursor for the formation of citrulline, proline and glutamic acid.

Ornithine stimulates the production of growth hormone and helps prevent aging by combating muscle loss. It also helps in removing toxic chemicals from the liver and helps prevent liver cirrhosis. Small amounts of ornithine also helps to increase the healing process in patients with trauma and burns.

Good sources of ornithine includes meat, fish, dairy products, and eggs.

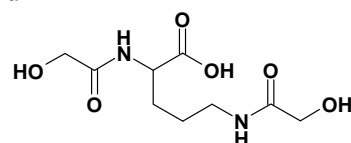
Functionalized Ornithine



Functionalized Ornithine

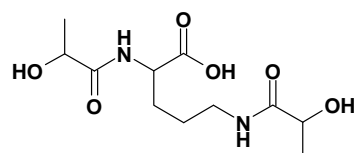
19-1611 **2,5-Bis-(2-hydroxy-acetylamino)-pentanoic acid**

$C_9H_{16}N_2O_6$
248.24



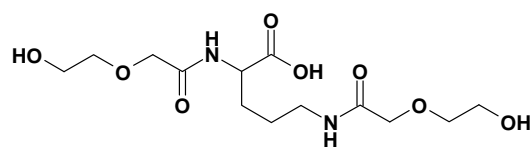
19-1612 **2,5-Bis-(2-hydroxypropionylamino)-pentanoic acid**

$C_{11}H_{20}N_2O_6$
276.29



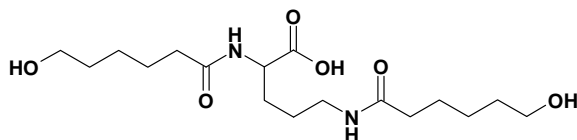
19-1613 **2,5-Bis-[2-(2-hydroxy-ethoxy)-acetylamino]-pentanoic acid**

$C_{13}H_{24}N_2O_8$
336.34

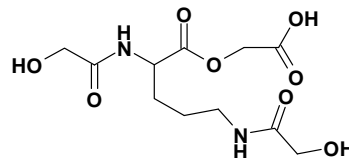


19-1614 **2,5-Bis-(6-hydroxy-hexanoylamino)-pentanoic acid**

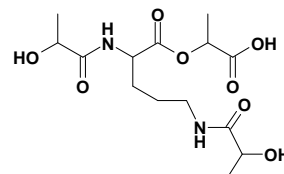
$C_{11}H_{32}N_2O_6$
360.45



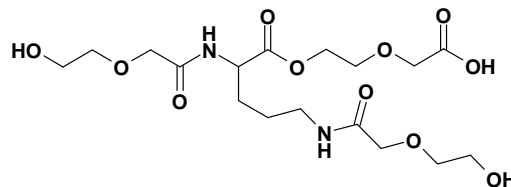
19-1615 **2,5-Bis-(2-hydroxy-acetylamino)-pentanoic acid carboxymethyl ester**
 $C_{11}H_{18}N_2O_8$
306.27



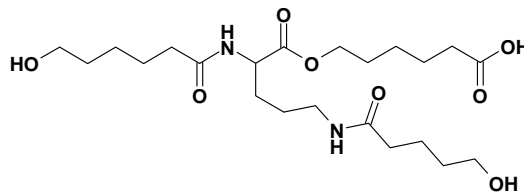
19-1616 **2-(2,5-bis (2-hydroxyacetamido)pentanoyloxy) propanoic acid**
 $C_{14}H_{24}N_2O_8$
348.36



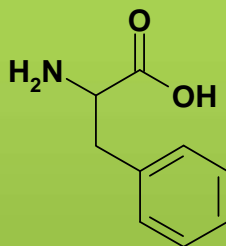
19-1617 **2,5-Bis-[2-(2-hydroxy-ethoxy)-acetylamino]-pentanoic acid 2-carboxymethoxy-ethyl ester**
 $C_{17}H_{30}N_2O_{11}$
438.44



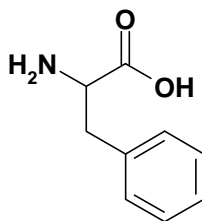
19-1618 **6[2-(6-Hydroxy-hexanoylamino)-5-(5-hydroxy-pentanoylamino)-pentanoyloxy]-hexanoic acid**
 $C_{22}H_{40}N_2O_8$
460.57



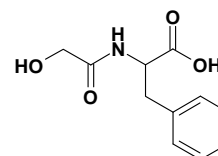
Phenylalanine



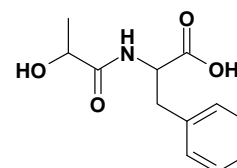
Phenylalanine is an essential alpha amino acid. It is critical for normal functioning of central nervous system on account of its ability to cross the blood brain barrier. It helps to control symptoms of depression and chronic pain, as well as other diseases linked to a malfunctioning of central nervous system. Hence, it may work to enhance the effect of painkillers on account of its anti-analgesic and anti-depressant activities. It is also proposed to be used by the body to make neurotransmitters such as epinephrine, dopamine, and norepinephrine.

Functionalized Phenylalanine**Phenylalanine****19-1619 2-(2-Hydroxy-acetyl-amino)-3-phenyl-propionic acid**

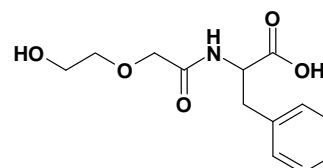
$C_{11}H_{13}NO_4$
223.23

**19-1620 2-(2-Hydroxy-propionyl-amino)-3-phenyl-propionic acid**

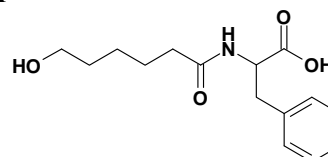
$C_{12}H_{15}NO_4$
237.26

**19-1621 2-[2-(2-Hydroxy-ethoxy)-acetyl-amino]-3-phenyl-propionic acid**

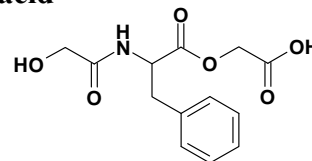
$C_{13}H_{17}NO_5$
267.28

**19-1622 2-(6-Hydroxy-hexanoyl-amino)-3-phenyl-propionic acid**

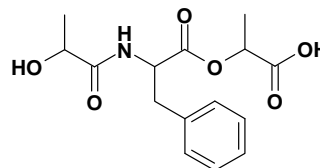
$C_{15}H_{21}NO_4$
279.34



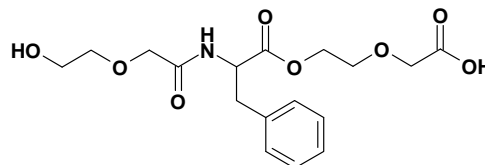
19-1623 **2-(2-Hydroxy-acetylamino)-3-phenyl-propionic acid
carboxymethyl ester**
C₁₃H₁₅NO₆
281.27



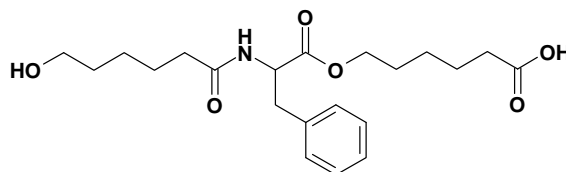
19-1624 **2-(2-Hydroxy-propionylamino)-3-phenyl propionic acid 1-
carboxy ethyl ester**
C₁₅H₁₉NO₆
309.32



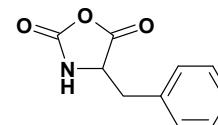
19-1625 **2-[2-(2-Hydroxy-ethoxy)-acetylamino]-3-pheny-propionic acid 2-carboxy
methoxy ethyl ester**
C₁₇H₂₃NO₈
369.37

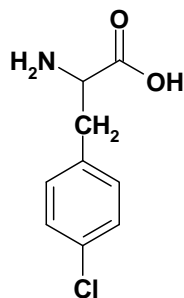


19-1626 **6-[2-(6-Hydroxy-hexanoylamino)-3-phenyl-propionyloxy]-
hexanoic acid**
C₂₁H₃₁NO₆
393.48

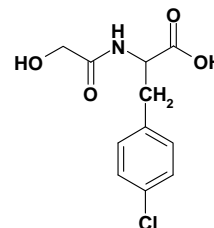


19-1627 **(Phenylalanine N-carboxyanhydride)
4-Benzyl-oxazolidine-2,5-dione**
C₁₀H₉NO₃
191.19

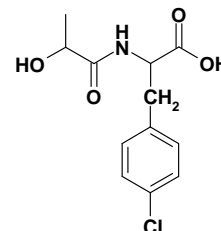


Functionalized 4-Chlorophenylalanine**4-Chlorophenylalanine**

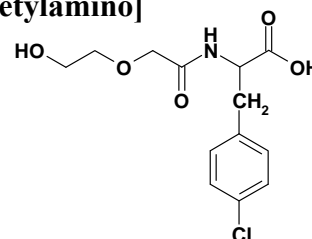
19-1506 **3-(4-Chloro-phenyl)-2-(2-hydroxy-acetylamino)-propionic acid**
C₁₁H₁₂ClNO₄
MW 257.68



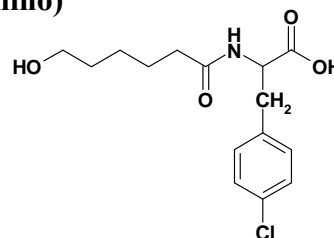
19-1507 **3-(4-Chloro-phenyl)-2-(2-hydroxy-propionylamino)-propionic acid**
C₁₂H₁₄ClNO₄
MW 271.70



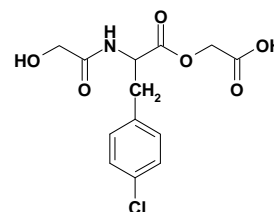
19-1508 **3-(4-Chloro-phenyl)-2-[2-(2-hydroxy-ethoxy)-acetylamino]-propionic acid**
C₁₃H₁₆ClNO₅
MW 301.73



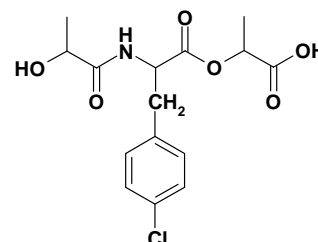
19-1509 **3-(4-Chloro-phenyl)-2-(6-hydroxy-hexanoylamino)-propionic acid**
C₁₅H₂₀ClNO₄
MW 313.78



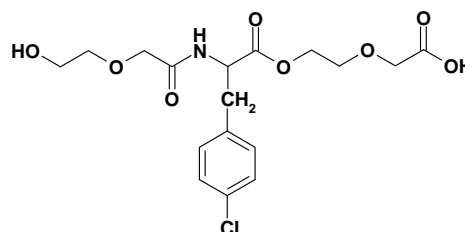
19-1510 **3-(4-Chloro-phenyl)-2-(2-hydroxy-acetylamino)-propionic acid carboxymethyl ester**
C₁₃H₁₄ClNO₄
MW 315.71



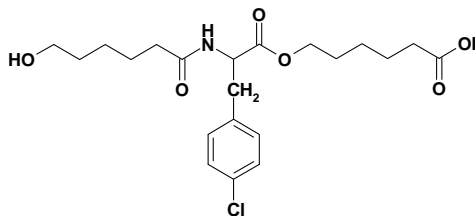
19-1511 **3-(4-Chloro-phenyl)-2-(2-hydroxy-propionylamino)-propionic acid 1-carboxy-ethyl ester**
C₁₅H₁₈ClNO₆
MW 343.77



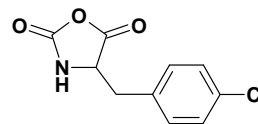
19-1512 **3-(4-Chloro-phenyl)-2-[2-(2-Hydroxy-ethoxy)-acetylamino]-propionic acid 2-carboxymethoxy ethyl ester**
C₁₇H₂₂ClNO₈
MW 403.82

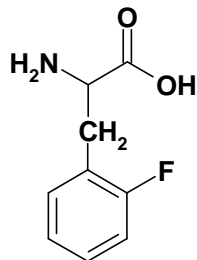


19-1513 **6-[3-(4-Chloro-phenyl)-2-(6-hydroxy-hexanoylamino)-propionyloxy]
hexanoic acid**
C₂₁H₃₀ClNO₆
MW 427.93

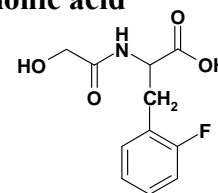


19-1514 **(4-Chlorophenylalanine N-Carboxyanhydride)**
4-(4-Chloro-benzyl)-oxazolidine-2,5-dione
C₁₀H₈ClNO₃
225.63

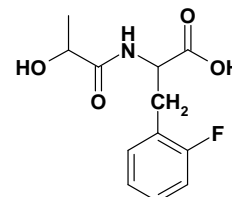


Functionalized 2-Fluorophenylalanine**2-Fluorophenylalanine**

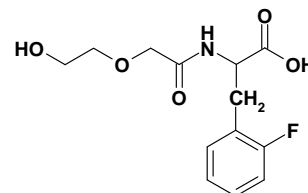
19-1524

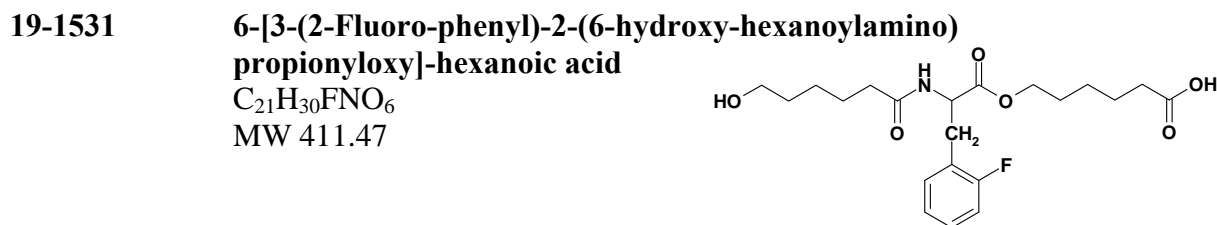
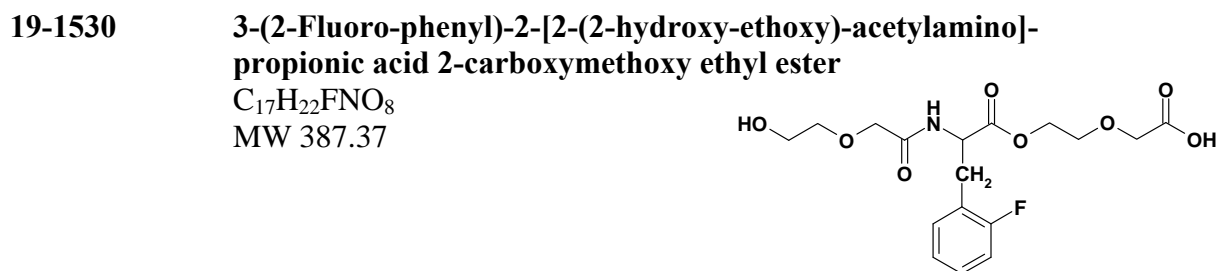
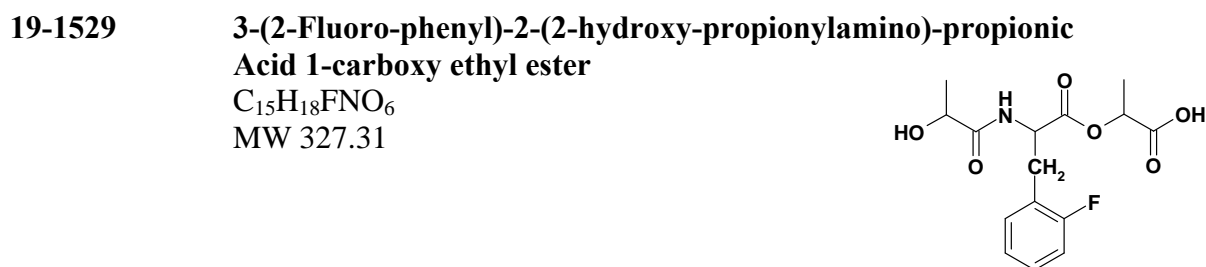
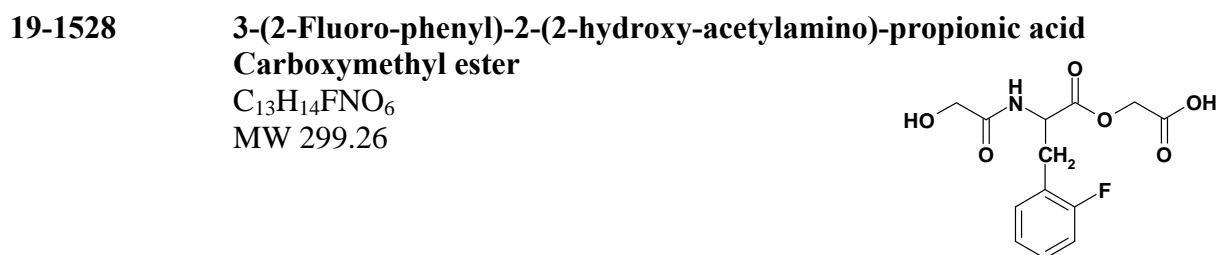
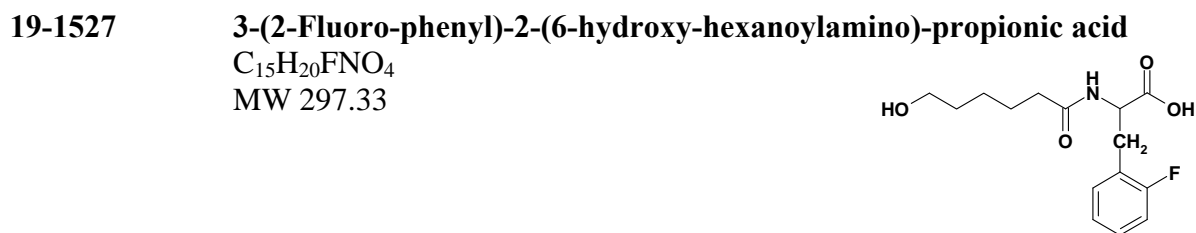
3-(2-Fluoro-phenyl)-2-(2-hydroxy-acetylamino)-propionic acidC₁₁H₁₂FNO₄
MW 241.22

19-1525

3-(2-Fluoro-phenyl)-2-(2-hydroxy-propionylamino)-propionic acidC₁₂H₁₄FNO₄
MW 255.25

19-1526

3-(2-Fluoro-phenyl)-2-[2-(2-hydroxy-ethoxy)-acetylamino]-propionic acidC₁₃H₁₆FNO₅
MW 285.27





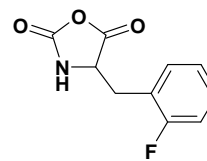
19-1532

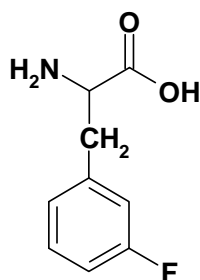
(2-Fluorophenylalanine N-Carboxyanhydride)

4-(2-Fluoro-benzyl)-oxazolidine-2,5-dione

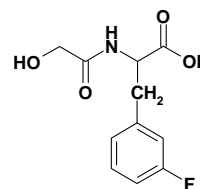
$C_{10}H_8FNO_3$

209.18

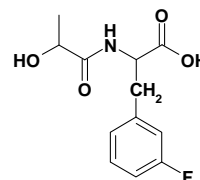


Functionalized 3-Fluorophenylalanine**3-Fluorophenylalanine**

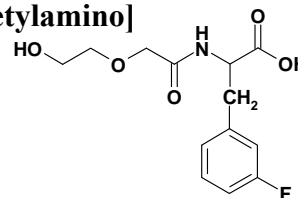
19-1533 **2-(6-Hydroxy-hexanoylamino)-4-methylsulfanyl butyric acid**
C₁₁H₁₂FNO₄
MW 241.22



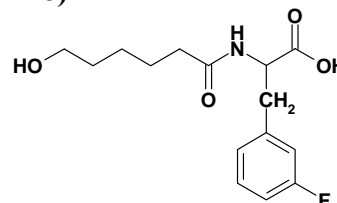
19-1534 **3-(3-Fluoro-phenyl)-2-(2-hydroxy-propionylamino)-propionic acid**
C₁₂H₁₄FNO₄
MW 255.25



19-1535 **3-(3-Fluoro-phenyl)-2-[2-(2-hydroxy-ethoxy)-acetylamino]-propionic acid**
C₁₃H₁₆FNO₅
MW 285.27

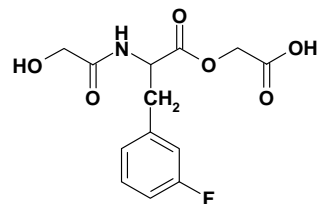


19-1536 **3-(3-Fluoro-phenyl)-2-(6-hydroxy-hexanoylamino)-propionic acid**
C₁₅H₂₀FNO₄
MW 297.33

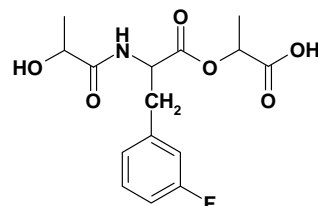


19-1537 3-(3-Fluoro-phenyl)-2-(2-hydroxy-acetylamino)-propionic acid carboxymethyl ester

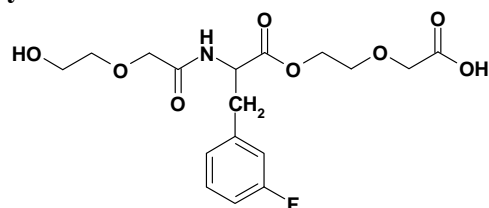
$C_{13}H_{14}FNO_6$
MW 299.26

**19-1538 3-(3-Fluoro-phenyl)-2-(2-hydroxy-propionylamino)-propionic acid 1-carboxy ethyl ester**

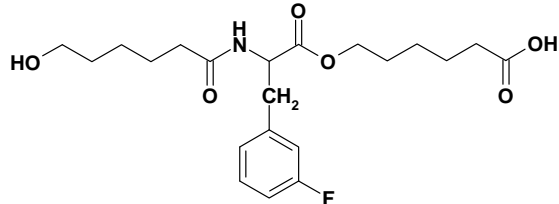
$C_{15}H_{18}FNO_6$
MW 327.31

**19-1539 3-(3-Fluoro-phenyl)-2-(2-(2-hydroxy-ethoxy)-acetylamino) propionic acid 2-carboxymethoxy-ethyl ester**

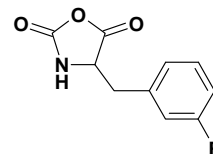
$C_{17}H_{22}FNO_8$
MW 387.37

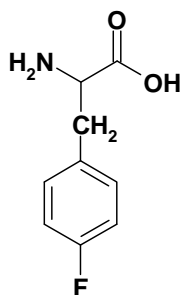
**19-1540 6-(3-(3-Fluoro-phenyl)-2-(6-hydroxy-hexanoylamino) propionyloxy]-hexanoic acid**

$C_{21}H_{30}FNO_6$
MW 411.47

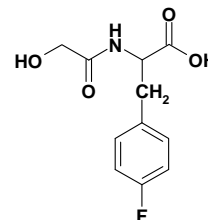
**19-1541 (3-Fluorophenylalanine N-Carboxyanhydride) 4-(3-Fluoro-benzyl)-oxazolidine-2,5-dione**

$C_{10}H_8FNO_3$
209.18

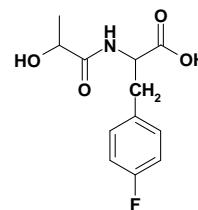


Functionalized 4-Fluorophenylalanine**4-Fluorophenylalanine****19-1542****3-(4-Fluoro-phenyl)-2-(2-hydroxy-acetylamino)-propionic acid**C₁₁H₁₂FNO₄

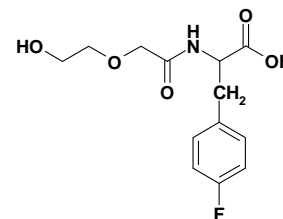
MW 241.22

**19-1543****3-(4-Fluoro-phenyl)-2-(2-hydroxy-propionylamino)-propionic acid**C₁₂H₁₄FNO₄

MW 255.25

**19-1544****3-(4-Fluoro-phenyl)-2-[2-(2-hydroxy-ethoxy)-acetylamino]-propionic acid**C₁₃H₁₆FNO₅

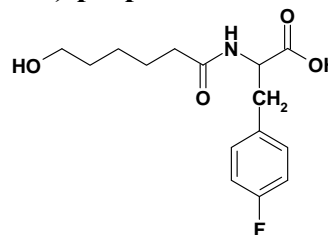
MW 285.27



19-1545

3-(4-Fluoro-phenyl)-2-(6-hydroxy-hexanoylamino)-propionic acidC₁₅H₂₀FNO₄

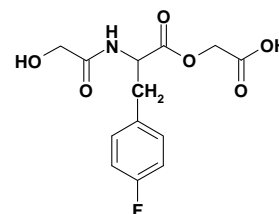
MW 297.33



19-1546

**3-(4-Fluoro-phenyl)-2-(2-hydroxy-acetylamino)-propionic acid
carboxymethyl ester**C₁₃H₁₄FNO₆

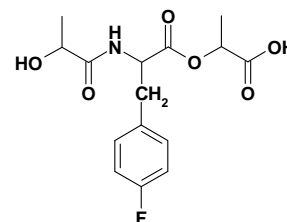
MW 299.26



19-1547

**3-(4-Fluoro-phenyl)-2-(2-hydroxypropionylamino)-propionic
Acid 1-carboxy-ethyl ester**C₁₅H₁₈FNO₆

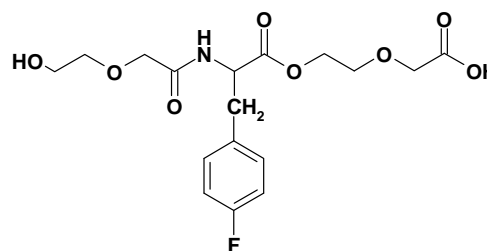
MW 327.31



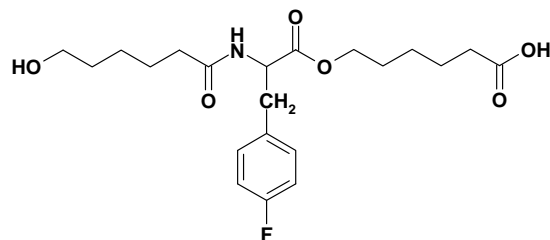
19-1548

**3-(4-Fluoro-phenyl)-2-[2-(2-hydroxy-ethoxy)-acetylamino]-
propionic acid 2-carboxymethoxy-ethyl ester**C₁₇H₂₂FNO₈

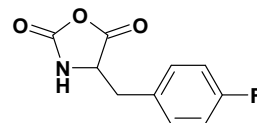
MW 387.37

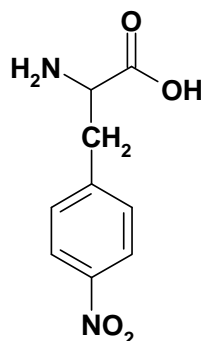


19-1549

**6-[3-(4-Fluoro-phenyl)-2-(6-hydroxy-hexanoylamino))-
propionyloxy]-hexanoic acid**C₂₁H₃₀FNO₆
MW 411.47

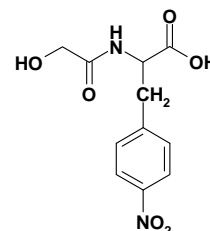
19-1550

**(4-Fluorophenylalanine N-Carboxyanhydride)
4-(4-Fluoro-benzyl)-oxazolidine-2,5-dione**C₁₀H₈FNO₃
209.18

Functionalized 4-Nitrophenylalanine**4-Nitrophenylalanine**

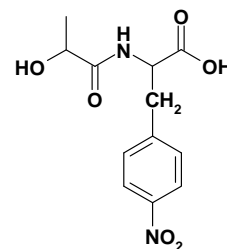
19-1584 **2-(2-Hydroxy-acetylamino) 3-(4-nitro-phenyl)-
-propionic acid**

$C_{11}H_{12}N_2O_6$
MW 268.23



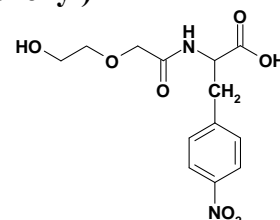
19-1585 **2-(2-Hydroxy-propionylamino)- 3-(4-nitro-phenyl)-propionic acid**

$C_{12}H_{14}N_2O_6$
MW 282.26

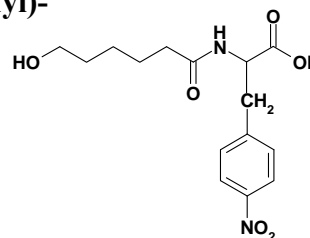


19-1586 **2-[2-(2-Hydroxy-ethoxy)-acetylamino] 3-(4-nitro-phenyl)-
-propionic acid**

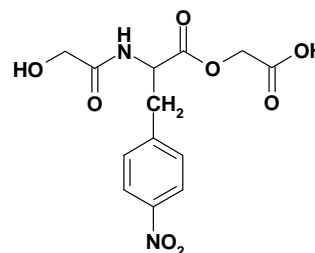
$C_{13}H_{16}N_2O_7$
MW 312.28



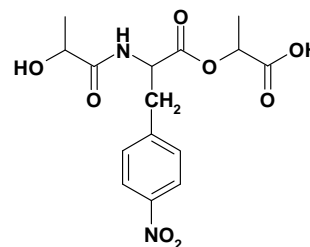
19-1587 **2-(6-Hydroxy-hexanoylamino) 3-(4-nitro-phenyl)-
-propionic acid**
C₁₅H₂₀N₂O₆
MW 324.34



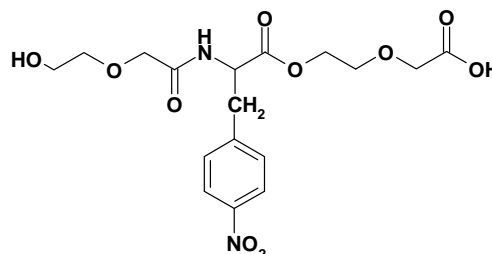
19-1588 **2-(2-Hydroxy-acetyl-amino)- 3-(4-nitro-phenyl)-propionic
acid carboxymethyl ester**
C₁₃H₁₄N₂O₈
MW 326.27



19-1589 **2-(2-Hydroxy-propionyl-amino)- 3-(4-nitro-phenyl)-propionic acid
1-carboxy-ethyl ester**
C₁₅H₁₈N₂O₈
MW 354.32



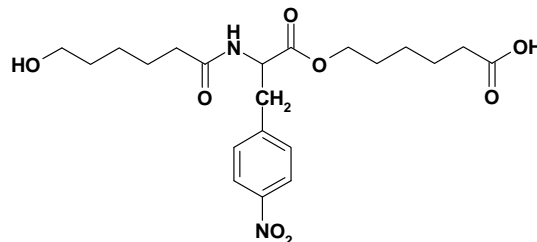
19-1590 **2-[2-(2-Hydroxy-ethoxy)-acetyl-amino]- 3-(4-nitro-phenyl)-
propionic acid 2-carboxymethoxy ethyl ester**
C₁₇H₂₂N₂O₁₀
MW 414.37





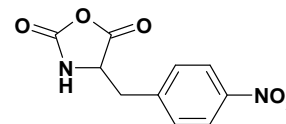
19-1591 **2-(6-Hydroxy-hexanoylamino)-propionyloxy] 6-[3-(4-nitro-phenyl)-hexanoic acid**

$C_{21}H_{30}N_2O_8$
MW 438.48



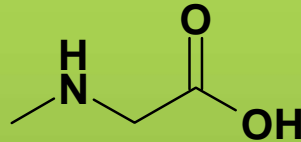
19-1592 **(Nitrophenylalanine N-Carboxyanhydride)**
4-(4-Nitro-benzyl)-oxazolidine-2,5-dione

$C_{10}H_8N_2O_5$
236.19



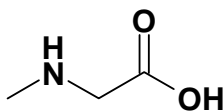


Sarcosine

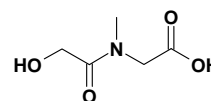


Sarcosine is a natural amino acid found in muscle and other body tissues. It is an intermediate and byproduct in glycine synthesis and degradation. There are some early evidences that suggest that sarcosine may be used in treatment of mental illness and depression. Preliminary studies have indicated that intake of Sarcosine helps improve the psychotic as well as depressive symptoms in patients with schizophrenia. Recent study has suggested that sarcosine may be used as biomarker for prostate cancer.

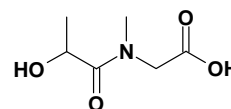
Good sources of tryosine includes egg yolks, turkey, ham, vegetables and legumes.

Functionalized Sarcosine**Sarcosine**

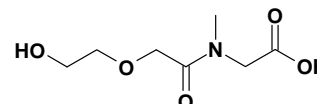
19-1637 **[(2-Hydroxy-acetyl)-methyl-amino]-acetic acid**
C₅H₉NO₄
147.13



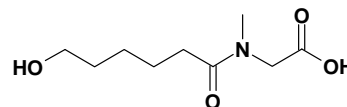
19-1638 **[(2-Hydroxy-propionyl)-methyl-amino]-acetic acid**
C₆H₁₁NO₄
161.16



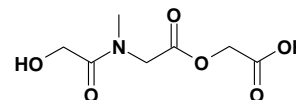
19-1639 **{[2-(2-Hydroxy-ethoxy)-acetyl]-methyl-amino}-acetic acid**
C₇H₁₃NO₅
191.19



19-1640 **[(6-Hydroxy-hexanoyl)-methyl-amino]-acetic acid**
C₉H₁₇NO₄
203.24

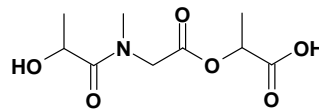


19-1641 **[(2-Hydroxy-acetyl)-methyl-amino]-acetic acid carboxymethyl ester**
C₇H₁₁NO₆
205.17

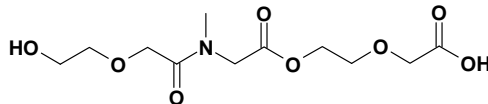




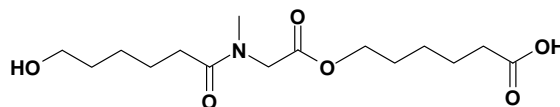
19-1642 2-{2-[(2-Hydroxy-propionyl)-methyl-amino]-acetoxy}
propionic acid
 $C_9H_{15}NO_6$
233.22



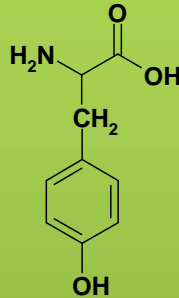
19-1643 [2-(2-{[2-(2-Hydroxy-ethoxy)-acetyl]-methyl-amino}acetoxy)-ethoxy]-
acetic acid
 $C_{11}H_{19}NO_8$
293.28



19-1644 6-{2-[(6-Hydroxy-hexanoyl)-methyl-amino]-acetoxy}-hexanoic acid
 $C_{15}H_{27}NO_6$
317.39



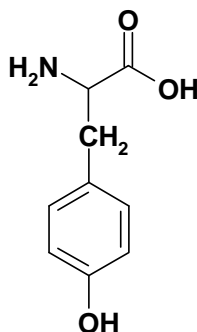
Tyrosine



Tyrosine is a non-essential amino acid. It is derived in the body from phenylalanine. Tyrosine plays various roles on account of its phenolic functionality. For example, tyrosine has been reported to have antioxidant effects which may play important role in protection from cancer, heart disease and aging. Furthermore, tyrosine may prove helpful in treating people with Alzheimers disease and other form of dementia and participates in stimulating nervous system. It is also essential for the normal functioning of the thyroid, pituitary, and adrenal glands. Furthermore, it can also help speed up the rate of metabolism.

Good sources of tyrosine includes almonds, avocados, bananas, dairy foods, beans, and seeds.

Functionalized Tyrosine



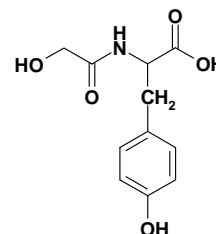
Tyrosine

19-1654

2-(2-Hydroxy-acetylamino)-3-(4-hydroxy-phenyl)-propionic acid

$C_{11}H_{13}NO_5$

239.23

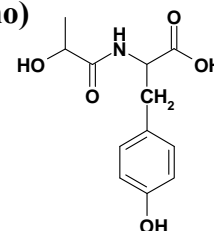


19-1655

3-(4-Hydroxy-phenyl)-2-(2-hydroxy-propionylamino)-propionic acid

$C_{12}H_{15}NO_5$

253.26

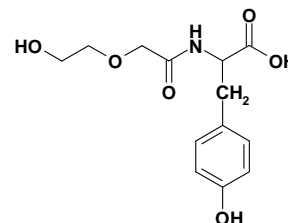


19-1656

2-[2-(2-Hydroxy-ethoxy)-acetylamino]-3-(4-hydroxy-phenyl)propionic acid

$C_{13}H_{17}NO_6$

283.28

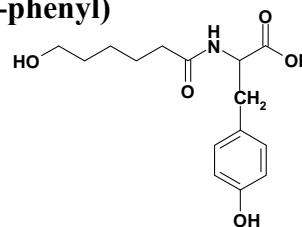




19-1657

**2-(6-Hydroxy-hexanoylamino)-3-(4-hydroxy-phenyl)
propionic acid**

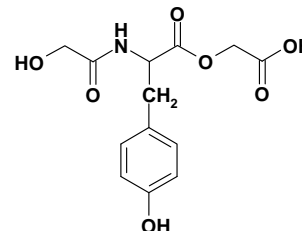
$C_{15}H_{21}NO_5$
295.34



19-1658

**2-(2-Hydroxy-acetyl-amino)-3-(4-hydroxy-phenyl)-propionic acid
carboxymethyl ester**

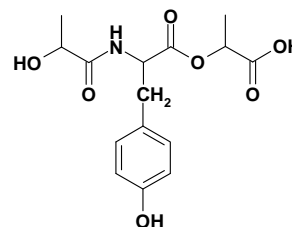
$C_{13}H_{15}NO_7$
297.27



19-1659

**3-(4-Hydroxy-phenyl)-2-(2-hydroxy-propionyl-amino)-propionic
acid**

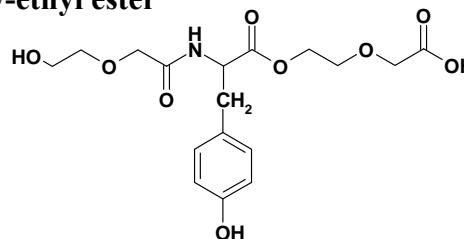
$C_{15}H_{19}NO_7$
325.32



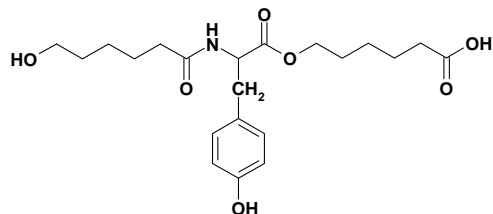
19-1660

**2-[2-(2-Hydroxy-ethoxy)-acetyl-amino]-3-(4-hydroxy-phenyl)
propionic acid 2-carboxymethoxy-ethyl ester**

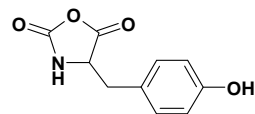
$C_{17}H_{23}NO_9$
385.37



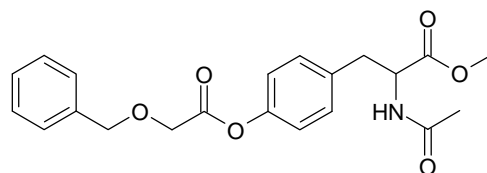
19-1661

6-[2-(6-Hydroxy-hexanoylamino)-3-(4-hydroxy-phenyl)propionyloxy]-hexanoic acidC₂₁H₃₁NO₇
409.48

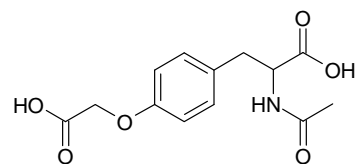
19-1662

**(Tyrosine N-Carboxyanhydride)
4-(4-Hydroxy-benzyl)-oxazolidine-2,5-dione**C₁₀H₉NO₄
207.19

19-879

2-Acetylamino-3-[4-(2-benzyloxy-acetoxy)-phenyl]-propionic acid methylesterC₂₁H₂₃NO₆
MW 385.42
mp 90.8-92.2°C
White powder
Soluble in chloroform

19-880

2-Acetylamino-3-(4-carboxymethoxy-phenyl)-propionic acidC₁₃H₁₅NO₆
MW 281.27
Light yellow syrup
Soluble in chloroform

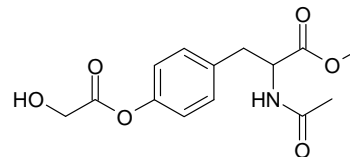
19-881 2-Acetylamino-3-[4-(2-hydroxy-acetoxy)-phenyl]-propionic acid methyl esterC₁₄H₁₇NO₆

MW 295.29

mp 132-134°C

White powder

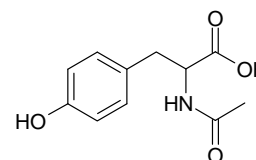
Soluble in chloroform

**19-882 2-Acetylamino-3-(4-hydroxy-phenyl)-propionic acid**C₁₁H₁₃NO₄

MW 223.23

Light yellow syrup

Soluble in chloroform

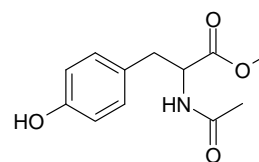
**19-883 2-Acetylamino-3-(4-hydroxy-phenyl)-propionic acid methyl ester**C₁₂H₁₅NO₄

MW 237.26

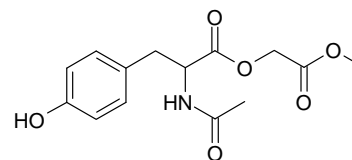
mp 135-137.5°C

White shining powder

Soluble in DMF

**19-884 2-Acetylamino-3-(4-hydroxy-phenyl)-propionic acid methoxycarbonylmethyl ester**C₁₄H₁₇NO₆

MW 295.29



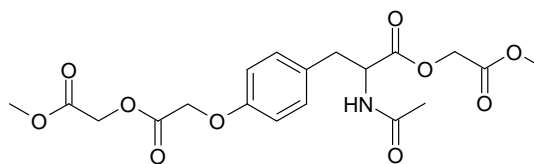
19-885 2-Acetylamino-3-(4-methoxycarbonylmethoxy carbonyl methoxy-phenyl)-propionic acid methoxy carbonyl methyl esterC₁₉H₂₃NO₁₀

MW 425.40

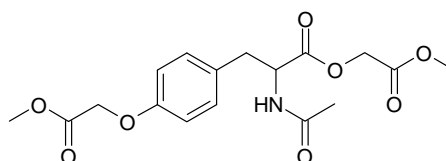
mp 93-96°C

White powder

Soluble in chloroform

**19-886 2-Acetylamino-3-(4-methoxycarbonylmethoxy-phenyl)propionic acid methoxy carbonyl methyl ester**C₁₇H₂₁NO₈

MW 367.36

**19-887 2-Acetylamino-3-(4-methoxycarbonylmethoxy-phenyl)-propionic acid methyl ester**

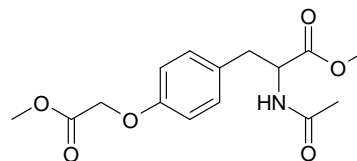
MW 309.32

C₁₅H₁₉NO₆

mp 113-115°C

White powder

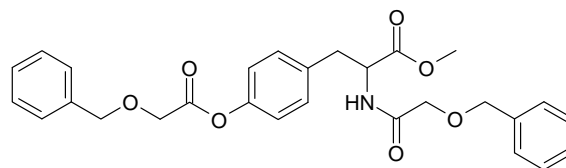
Soluble in chloroform

**19-912 3-[4-(2-Benzoyloxy-acetoxy)-phenyl]-2-(2-benzyloxy acetylamino)-propionic acid methyl ester**C₂₈H₂₉NO₇

MW 491.55

Pale yellow syrup

Soluble in chloroform

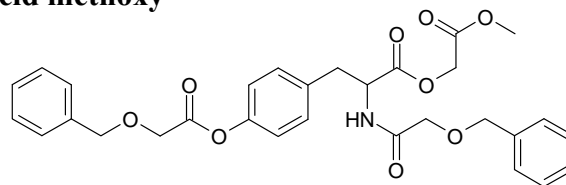


19-913 3-[4-(2-Benzyloxy-acetoxy)-phenyl]-2-(2-benzyloxy-acetylamino)-propionic acid methoxy carbonylmethyl esterC₃₀H₃₁NO₉

MW 549.58

Pale yellow syrup

Soluble in chloroform

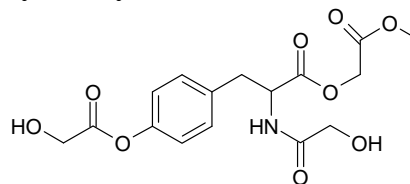
**19-916 2-(2-Benzyloxy-acetylamino)-3-[4-(2-hydroxy-acetoxy)-phenyl]-propionic acid methoxycarbonylmethyl ester**C₁₆H₁₉NO₉

MW 369.33

m.p: 116.5-118.5°C

White powder

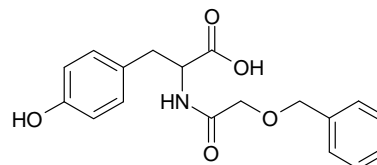
Soluble in chloroform

**19-917 2-(2-Benzyloxy-acetylamino)-3-(4-hydroxy-phenyl) propionic acid**C₁₈H₁₉NO₅

MW 329.36

Light yellow syrup

Soluble in chloroform

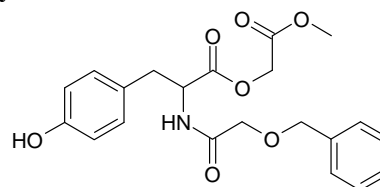
**19-918 2-(2-Benzyloxy-acetylamino)-3-(4-hydroxy-phenyl) propionic acid methoxy carbonyl methyl ester**C₂₁H₂₃NO₇

MW 401.42

mp 93.5-96.2°C

White powder

Soluble in chloroform

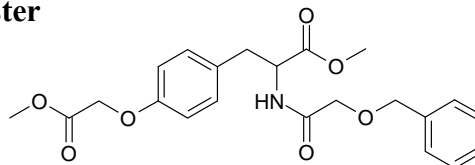


19-919 2-(2-Benzyloxy-acetylamino)-3-(4-methoxycarbonylmethoxy phenyl)-propionic acid methyl esterC₂₂H₂₅NO₇

MW 415.45

Light yellow syrup

Soluble in chloroform

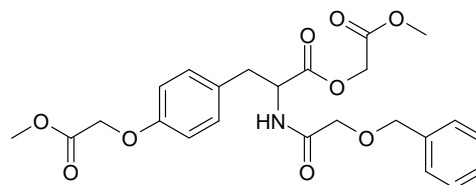
**19-920 2-(2-Benzyloxy-acetylamino)-3-(4-methoxycarbonylmethoxy phenyl)-propionic acid 2-methoxycarbonyl-ethyl ester**C₂₄H₂₇NO₉

MW 473.48

mp 42-44^oC

White powder

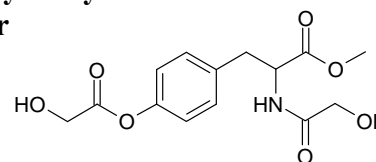
Soluble in chloroform

**19-953 3-[4-(2-Hydroxy-acetoxy)-phenyl]-2-(2-hydroxy-acetylamino)-propionic acid methyl ester**C₁₄H₁₇NO₇

MW 311.29

Light yellow color syrup

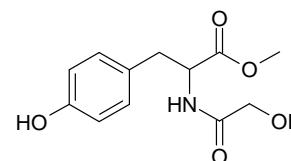
Soluble in chloroform

**19-954 2-(2-Hydroxy-acetylamino)-3-(4-hydroxy-phenyl)-propionic acid methyl ester**C₁₂H₁₅NO₅

MW 253.26

Yellow syrup

Soluble in chloroform

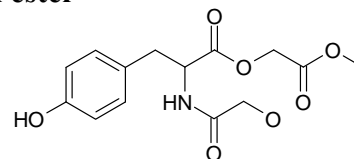


**19-955 2-(2-Hydroxy-acetylamino)-3-(4-hydroxy-phenyl)
propionic acid methoxy carbonyl methyl ester**C₁₄H₁₇NO₇

MW 311.29

Light yellow color syrup

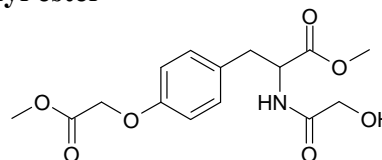
Soluble in DMF

**19-956 2-(2-Hydroxy-acetylamino)-3-(4-methoxycarbonyl
methoxy-phenyl)-propionic acid methyl ester**C₁₅H₁₉NO₇

MW 325.32

Yellow syrup

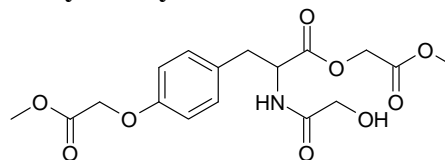
Soluble in chloroform

**19-957 2-(2-Hydroxy-acetylamino)-3-(4-methoxycarbonylmethoxy
-phenyl)-propionic acid methoxycarbonylmethyl ester**C₁₇H₂₁NO₉

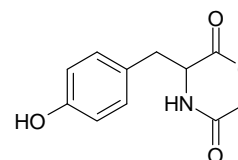
MW 383.36

Yellow syrup

Soluble in chloroform

**19-962 3-(4-Hydroxy-benzyl)-morpholine-2,5-dione**C₁₁H₁₁NO₄

MW 221.21





19-980

**3-(4-Hydroxy-phenyl)-2-phenethoxycarbonylamino
-propionic acid methyl ester**

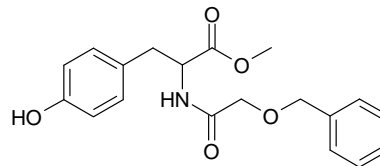
$C_{19}H_{21}NO_5$

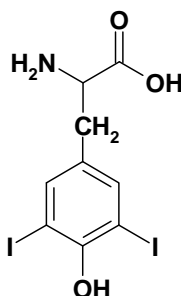
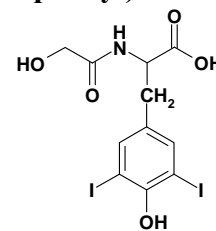
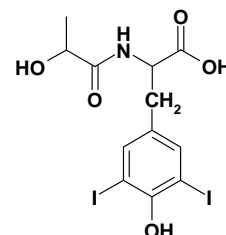
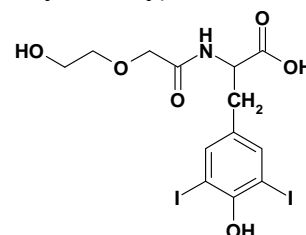
MW 343.38

mp 68-70°C

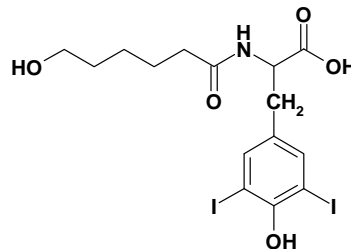
White powder

Soluble in chloroform

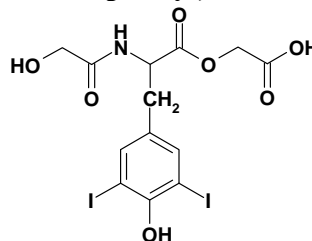


Functionalized 3,5-Diiodotyrosine**3,5-Diiodotyrosine****19-1515****2-(2-Hydroxy-acetylamino)-3-(4-hydroxy-3,5-diiodo-phenyl)-propionic acid**C₁₁H₁₁I₂NO₅
MW 491.02**19-1516****3-(4-Hydroxy-3,5-diiodo-phenyl)-2-(2-hydroxy-propionylamino)-Propionic acid**C₁₂H₁₃I₂NO₅
MW 505.05**19-1517****3-(4-Hydroxy-3,5-diiodo-phenyl)-2-[2-(2-hydroxy-ethoxy)-acetylamino] propionic acid**C₁₃H₁₅I₂NO₆
MW 535.08

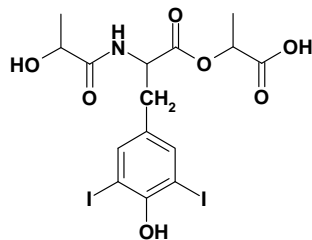
19-1518 **3-(4-Hydroxy-3,5-diiodo-phenyl)-2-(6-hydroxy-hexanoylamino)-propionic acid**
C₁₅H₁₉I₂NO₅
MW 547.13



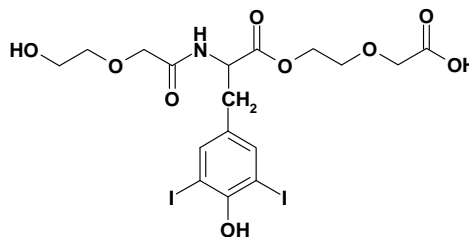
19-1519 **2-(2-Hydroxy-acetylamino)-3-(4-hydroxy-3,5-diiodo-phenyl)-propionic acid carboxymethyl ester**
C₁₃H₁₃I₂NO₇
MW 549.06



19-1520 **3-(4-Hydroxy-3,5-diiodo-phenyl)-2-(2-hydroxy-propionylamino) propionic acid 1-carboxy-ethyl ester**
C₁₅H₁₇I₂NO₇
MW 577.11

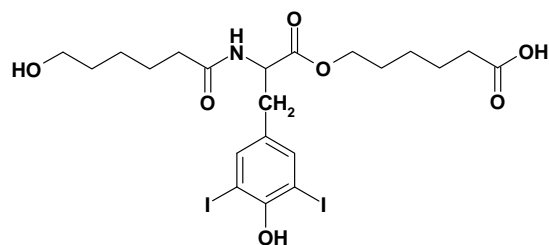


19-1521 **3-(4-Hydroxy-3,5-diiodo-phenyl)-2-[2-(2-hydroxy-ethoxy)-acetylamino]propionic acid 2-carboxymethoxy-ethyl ester**
C₁₇H₂₁I₂NO₉
MW 637.17



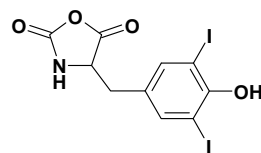
19-1522 **6-[3-(4-Hydroxy-3,5-diiodo-phenyl)-2-(6-hydroxy-hexanoylamino) Propionyloxy]-hexanoic acid**

$C_{21}H_{29}I_2NO_7$
MW 661.28



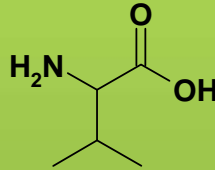
19-1523 **(Diiodotyrosine N-Carboxyanhydride)**
4-(4-Hydroxy-3,5-diiodo-benzyl)-oxazolidine

$C_{10}H_7I_2NO_4$
458.98



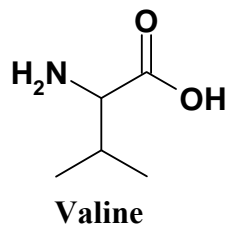


VALINE

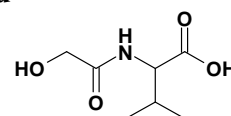


Valine is the branched chain essential amino acid associated with various health benefits. It works along with leucine and isoleucine to promote normal cell growth and regulate normal blood sugar levels. Furthermore, it helps repair tissues and provide the body with energy. Moreover, it helps stimulate the central nervous system, and is essential for proper functioning of brain. It also provides extra glucose for energy during intense physical activity to prevent muscle fatigue while removing potentially toxic excess nitrogen from the liver. It also helps alleviate liver and gallbladder disease along with alcohol-related brain damage.

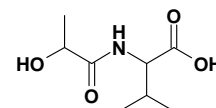
Good sources of Valine include meats, dairy products along with mushrooms, peanuts and soy proteins.

Functionalized Valine

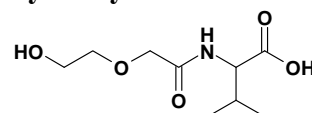
19-1663

2-(2-Hydroxy-acetylamino)-3-methyl-butiric acidC₇H₁₃NO₄
175.19

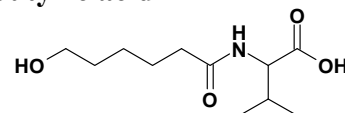
19-1664

2-(2-Hydroxy-propionylamino)-3-methyl-butiric acidC₈H₁₅NO₄
189.21

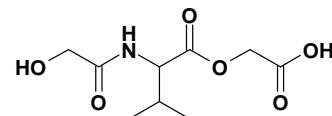
19-1665

2-[2-(2-Hydroxy-ethoxy)-acetylamino]-3-methyl-butiric acidC₉H₁₇NO₅
219.24

19-1666

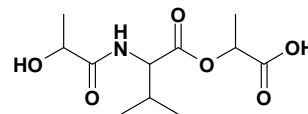
2-(6-Hydroxy-hexanoylamino)-3-methyl-butiric acidC₁₁H₂₁NO₄
231.29

19-1667

2-(2-Hydroxy-acetylamino)-3-methyl-butric acid carboxy methyl esterC₉H₁₅NO₆
233.22

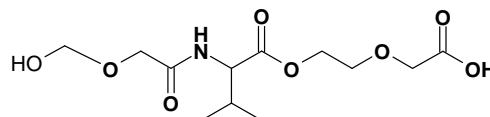
19-1668 **2-(2-Hydroxy-propionylamino)-3-methyl-butyrac acid 1-carboxy ethyl ester**

$C_{11}H_{19}NO_6$
261.28



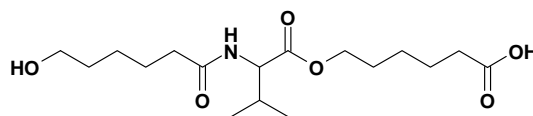
19-1669 **2-(2-Hydroxymethoxy-acetyl-amino)-3-methyl-butyrac acid 2-carboxymethoxy-ethyl ester**

$C_{12}H_{21}NO_8$
307.30



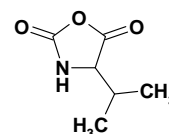
19-1670 **6-[2-(6-Hydroxy-hexanoylamino)-3-methyl-butyriloxy]-hexanoic acid**

$C_{17}H_{31}NO_6$
345.44

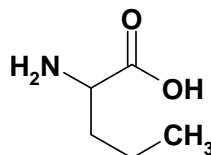


19-1671 **(Valine N-Carboxyanhydride)
4-Isopropyl-oxazolidine-2,5-dione**

$C_6H_9NO_3$
143.14



Functionalized Norvaline



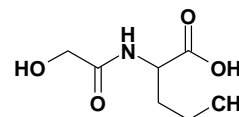
Norvaline

19-1602

2-(2-Hydroxy-acetylamino)-pentanoic acid

 $C_7H_{13}NO_4$

175.19

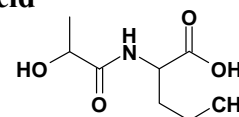


19-1603

2-(2-Hydroxy-propionyloxyamino)-pentanoic acid

 $C_8H_{15}NO_4$

189.21

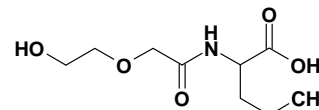


19-1604

2-[2-(2-Hydroxy-ethoxy)-acetylamino]-pentanoic acid

 $C_9H_{17}NO_5$

219.24

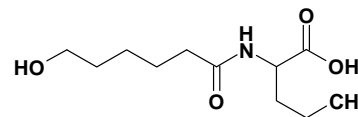


19-1605

2-(6-Hydroxy-hexanoylamino)-pentanoic acid

 $C_{11}H_{21}NO_4$

231.29

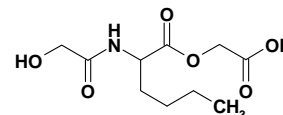


19-1606

2-(2-Hydroxy-acetylamino)-hexanoic acid carboxymethyl ester

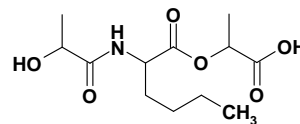
 $C_{10}H_{17}NO_6$

247.25

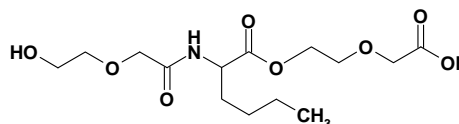




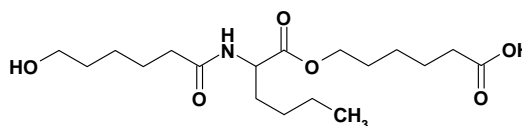
19-1607 **2-(2-Hydroxy-propionylamino)-hexanoic acid 1-carboxy ethyl ester**
C₁₂H₂₁NO₆
275.30



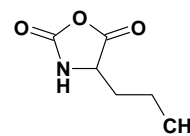
19-1608 **2-[2-(2-Hydroxy-ethoxy)-acetylamino]-hexanoic acid 2-carboxymethoxy ethyl ester**
C₁₄H₂₅NO₈
335.36



19-1609 **2-(6-Hydroxy-hexanoylamino)-hexanoic acid 5-carboxy-pentyl ester**
C₁₈H₃₃NO₆
359.47



19-1610 **(Norvaline N-Carboxyanhydride)
4-Propyl-oxazolidine-2,5-dione**
C₆H₉NO₃
143.14



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