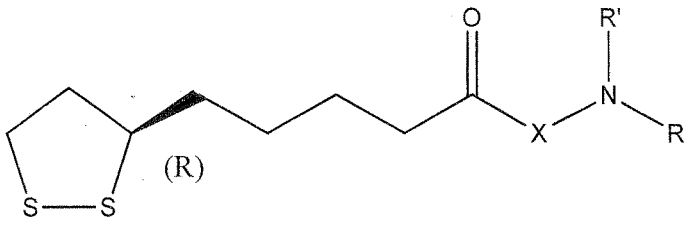
CLAIMS

What is claimed is:

1. A compound represented by Structural Formula (I):



(I),

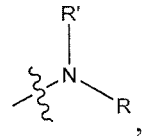
or a pharmaceutically acceptable salt thereof, wherein:

the enantiomeric excess or diastereomeric excess of the compound or pharmaceutically acceptable salt thereof is at least ~~or about~~ 90%;

R is $(C_1\text{-}C_{18})$alkyl, $(C_6\text{-}C_{18})$aryl or $(C_6\text{-}C_{18})$aryl$(C_1\text{-}C_{18})$alkyl and is substituted with at least one acidic substituent selected from the group consisting of $-CO_2H$, $-SO_3H$, $-PO_3H_2$, $-OSO_3H$, $-OPO_3H_2$, $-B(OH)_2$ and -NHOH, wherein the aryl of the $(C_6\text{-}C_{18})$aryl or $(C_6\text{-}C_{18})$aryl$(C_1\text{-}C_{18})$alkyl is optionally further substituted with one or more substituents selected from the group consisting of hydroxy, halo, $(C_1\text{-}C_3)$alkyl, halo$(C_1\text{-}C_3)$alkyl, cyano, nitro, $(C_1\text{-}C_3)$alkoxy and thio$(C_1\text{-}C_3)$alkyl;

R' is hydrogen or $(C_1\text{-}C_{18})$alkyl, wherein $(C_1\text{-}C_{18})$alkyl is optionally substituted with one or more acidic substituents selected from the group consisting of $-CO_2H$, $-SO_3H$, $-PO_3H_2$, $-OSO_3H$, $-OPO_3H_2$, $-B(OH)_2$ and -NHOH; and

X is absent or is an amino acid, wherein the amino acid is aspartic acid, tyrosine, glutamic acid or alanine and is oriented to form an amide linkage

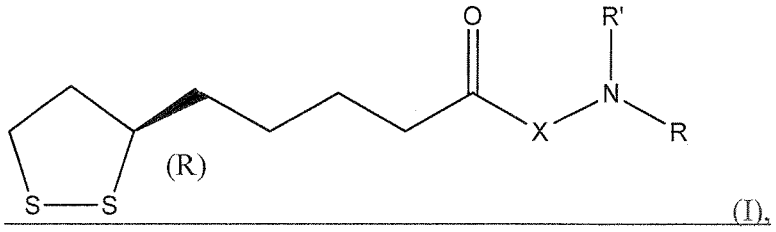
with 

,

provided that the compound of Structural Formula (I) is not *N*-(R)-lipoyl-glutamylalanine, *N*-(R)-lipoyl-aminoethylphosphonic acid, or (R)-5-(5-(1,2-dithiolan-3-yl)pentanamido)-2-hydroxybenzoic acid.

2. The compound of Claim 1, wherein X is absent.

3. A compound represented by Structural Formula (I):



(I),

or a pharmaceutically acceptable salt thereof, wherein:

the enantiomeric excess or diastereomeric excess of the compound or pharmaceutically acceptable salt thereof is at least 90%;

R is (C_1-C_{18})alkyl, (C_6-C_{18})aryl or (C_6-C_{18})aryl(C_1-C_{18})alkyl and is substituted with at least one acidic substituent selected from the group consisting of -CO_2H, -SO_3H, -PO_3H_2, -OSO_3H, -OPO_3H_2, -$B(OH)_2$ and -NHOH, wherein the aryl of the (C_6-C_{18})aryl or (C_6-C_{18})aryl(C_1-C_{18})alkyl is optionally further substituted with one or more substituents selected from the group consisting of hydroxy, halo, (C_1-C_3)alkyl, halo(C_1-C_3)alkyl, cyano, nitro, (C_1-C_3)alkoxy and thio(C_1-C_3)alkyl;

R' is hydrogen or (C_1-C_{18})alkyl, wherein (C_1-C_{18})alkyl is optionally substituted with one or more acidic substituents selected from the group consisting of -CO_2H, -SO_3H, -PO_3H_2, -OSO_3H, -OPO_3H_2, -$B(OH)_2$ and -NHOH; and

X is absent,

provided that the compound of Structural Formula (I) is not *N*-(R)-lipoyl-aminoethylphosphonic acid, or (R)-5-(5-(1,2-dithiolan-3-yl)pentanamido)-2-hydroxybenzoic acid.

~~4~~3. The compound of Claim 1, wherein X is an amino acid ~~and R' is hydrogen~~.

5. The compound of Claim 1 or 4, wherein X is an amino acid and R′ is hydrogen.

64. The compound of any of the preceding Claims ~~1~~, wherein R is:

$(C_1$-$C_3)$alkyl substituted with at least one acidic substituent selected from the group consisting of -CO_2H, -SO_3H, -PO_3H_2, -OSO_3H, -OPO_3H_2, -$B(OH)_2$ and -NHOH; or

(C_6)aryl substituted with at least one acidic substituent selected from the group consisting of -CO_2H, -SO_3H, -PO_3H_2, -OSO_3H, -OPO_3H_2, -$B(OH)_2$ and -NHOH, wherein the aryl of the (C_6)aryl is optionally further substituted with one or more substituents selected from the group consisting of hydroxy, halo, $(C_1$-$C_3)$alkyl, halo$(C_1$-$C_3)$alkyl, cyano, nitro, $(C_1$-$C_3)$alkoxy and thio$(C_1$-$C_3)$alkyl; or

(C_6)aryl$(C_1$-$C_3)$alkyl substituted with at least one acidic substituent selected from the group consisting of -CO_2H, -SO_3H, -PO_3H_2, -OSO_3H, -OPO_3H_2, -$B(OH)_2$ and -NHOH, wherein the aryl of the (C_6)aryl$(C_1$-$C_3)$alkyl is optionally further substituted with one or more substituents selected from the group consisting of hydroxy, halo, $(C_1$-$C_3)$alkyl, halo$(C_1$-$C_3)$alkyl, cyano, nitro, $(C_1$-$C_3)$alkoxy and thio$(C_1$-$C_3)$alkyl; or

$(C_1$-$C_3)$alkyl substituted with one or two acidic substituents each independently selected from -CO_2H, -SO_3H, -PO_3H_2, -OSO_3H and -OPO_3H_2.

75. The compound of Claim 1 to 3, wherein X is absent and R' is hydrogen.

86. The compound of Claim 75, wherein R is:

$(C_1$-$C_3)$alkyl substituted with one or two acidic substituents each independently selected from -CO_2H, -SO_3H, -PO_3H_2, -OSO_3H and -OPO_3H_2; or

(C_6)aryl$(C_1$-$C_3)$alkyl substituted with one or two acidic substituents each independently selected from -CO_2H, -SO_3H, -PO_3H_2, -OSO_3H and -OPO_3H_2, and wherein aryl is optionally substituted with halo and hydroxy; or

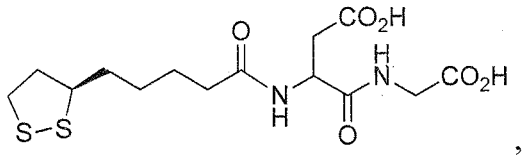
(C_2)alkyl substituted with one or two acidic substituents each independently selected from -CO_2H, -SO_3H, -PO_3H_2, -OSO_3H and -OPO_3H_2; or

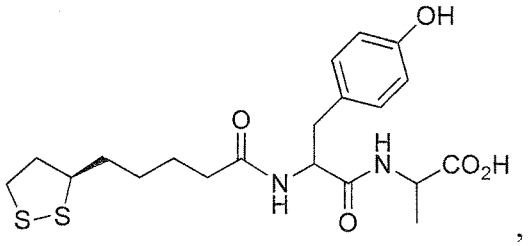
(C_6)aryl substituted with one acidic substituent selected from -CO_2H, -SO_3H, -PO_3H_2,-OSO_3H and -OPO_3H_2.

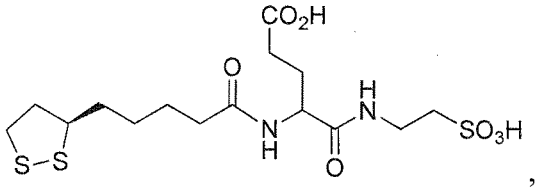
97. The compound of any of the preceding Claims ~~1~~, wherein R' is (C_1-C_3) alkyl substituted with at least one acidic substituent selected from the group consisting of -CO_2H, -SO_3H, -PO_3H_2, -OSO_3H and -OPO_3H_2.

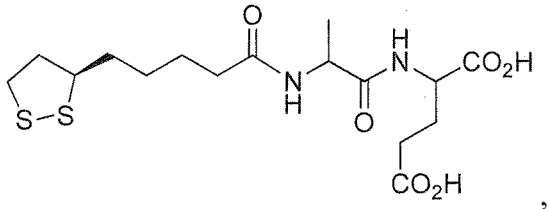
108. The compound of Claims 1 to 3, or Claim 97, wherein X is absent and R and R' are each (C_1-C_3)alkyl substituted with one acidic substituent selected from -CO_2H, -SO_3H, -PO_3H_2, -OSO_3H and -OPO_3H_2.

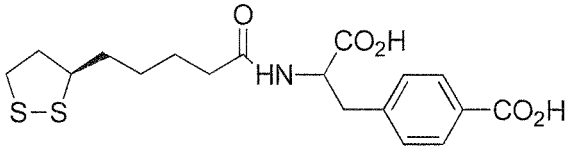
119. The compound of Claim 1, wherein the compound is represented by one of the following structural formulas:

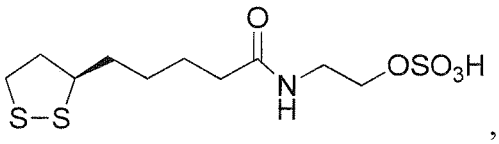

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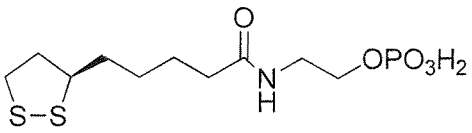

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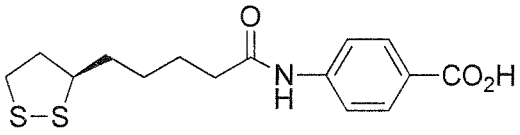

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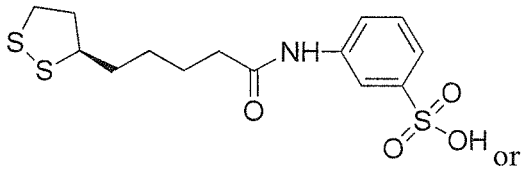
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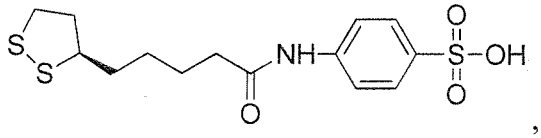
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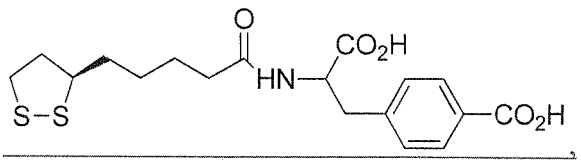
or



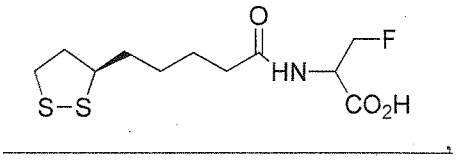
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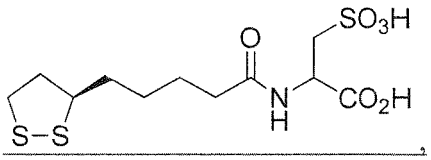
or a pharmaceutically acceptable salt thereof.

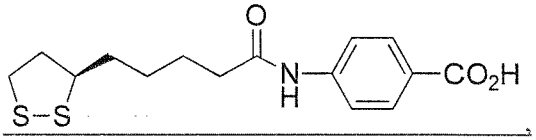
12. The compound of Claim 3, wherein the compound is represented by one of the following structural formulas:

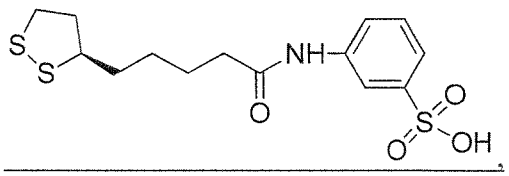


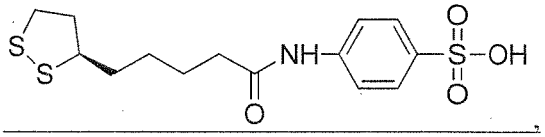
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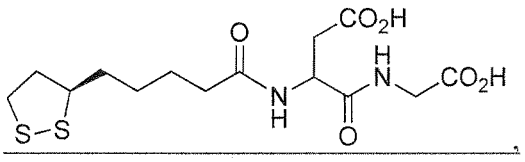


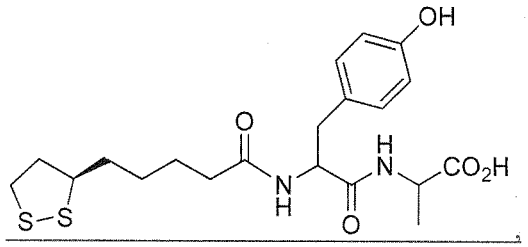


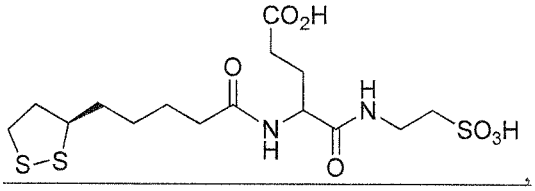


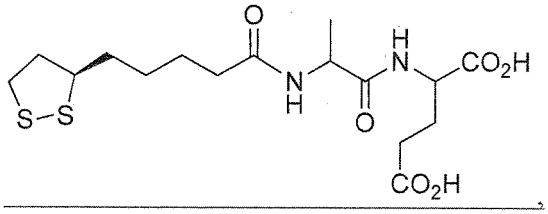
or a pharmaceutically acceptable salt thereof.

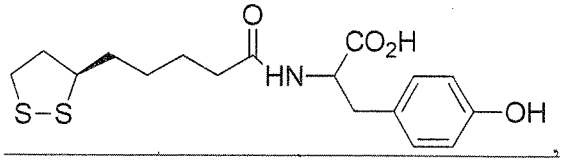
13. The compound of Claim 4, wherein the compound is represented by one of the following structural formulas:

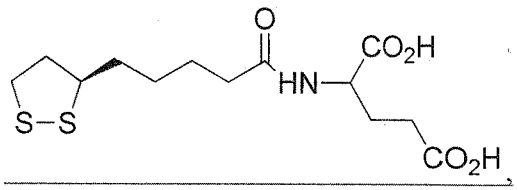








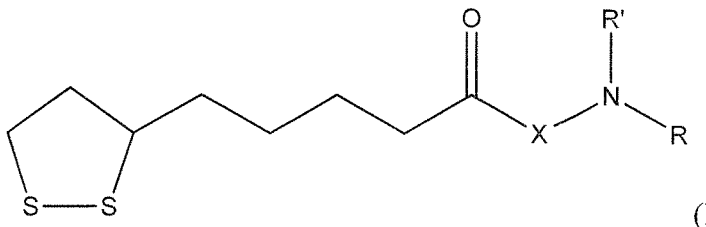




or a pharmaceutically acceptable salt thereof.

140. A composition, comprising a pharmaceutically acceptable carrier or diluent and one or more compounds of any one of Claims 1 to 139, or a pharmaceutically acceptable salt thereof.

151. Use of an effective amount of a compound represented by Structural Formula (Ia):



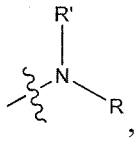
(Ia),

or a pharmaceutically acceptable salt thereof, wherein:

R is (C_1-C_{18})alkyl, (C_6-C_{18})aryl or (C_6-C_{18})aryl(C_1-C_{18})alkyl and is substituted with at least one acidic substituent selected from the group consisting of -CO_2H, -SO_3H, -PO_3H_2, -OSO_3H, -OPO_3H_2, -$B(OH)_2$ and -NHOH, wherein the aryl of the (C_6-C_{18})aryl or (C_6-C_{18})aryl(C_1-C_{18})alkyl is optionally further substituted with one or more substituents selected from the group consisting of hydroxy, halo, (C_1-C_3)alkyl, halo(C_1-C_3)alkyl, cyano, nitro, (C_1-C_3)alkoxy and thio(C_1-C_3)alkyl;

R' is hydrogen or (C_1-C_{18})alkyl, wherein (C_1-C_{18})alkyl is optionally substituted with one or more acidic substituents selected from the group consisting of -CO_2H, -SO_3H, -PO_3H_2, -OSO_3H, -OPO_3H_2, -$B(OH)_2$ and -NHOH; and

X is an amino acid, wherein the amino acid is oriented to form an amide linkage with



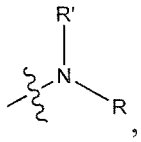
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provided that the compound of Structural Formula (Ia) is not *N*-lipoyl-glutamylalanine, *N*-lipoyl-aspartylglycine, or *N*-lipoyl-glutamylglycine; or

the compound is an (R)-lipoyl stereoisomer of a compound represented by Structural Formula (Ia), or a pharmaceutically acceptable salt thereof and the enantiomeric excess or diastereomeric excess of the compound or pharmaceutically acceptable salt thereof is at least ~~or about~~ 90%; and

R is $(C_1\text{-}C_{18})$alkyl, $(C_6\text{-}C_{18})$aryl or $(C_6\text{-}C_{18})$aryl$(C_1\text{-}C_{18})$alkyl and is substituted with at least one acidic substituent selected from the group consisting of $-CO_2H$, $-SO_3H$, $-PO_3H_2$, $-OSO_3H$, $-OPO_3H_2$, $-B(OH)_2$ and -NHOH, wherein the aryl of the $(C_6\text{-}C_{18})$aryl or $(C_6\text{-}C_{18})$aryl$(C_1\text{-}C_{18})$alkyl is optionally further substituted with one or more substituents selected from the group consisting of hydroxy, halo, $(C_1\text{-}C_3)$alkyl, halo$(C_1\text{-}C_3)$alkyl, cyano, nitro, $(C_1\text{-}C_3)$alkoxy and thio$(C_1\text{-}C_3)$alkyl;

R' is hydrogen or $(C_1\text{-}C_{18})$alkyl, wherein $(C_1\text{-}C_{18})$alkyl is optionally substituted with one or more acidic substituents selected from the group consisting of $-CO_2H$, $-SO_3H$, $-PO_3H_2$, $-OSO_3H$, $-OPO_3H_2$, $-B(OH)_2$ and -NHOH; and

X is absent or is an amino acid, wherein the amino acid is oriented to form an amide linkage with 

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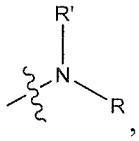
provided that the compound of Structural Formula (Ia) is not *N*-lipoyl-glutamylalanine, *N*-lipoyl-aspartylglycine, *N*-lipoyl-glutamylglycine or 5-(5-(1,2-dithiolan-3-yl)pentanamido)-2-hydroxybenzoic acid in the manufacture of a medicament for treating ischemic injury or ischemia reperfusion injury in a subject in need thereof.

162. The use of Claim 154, wherein:

R is $(C_1\text{-}C_{18})$alkyl, $(C_6\text{-}C_{18})$aryl or $(C_6\text{-}C_{18})$aryl$(C_1\text{-}C_{18})$alkyl and is substituted with at least one acidic substituent selected from the group consisting of $-CO_2H$, $-SO_3H$, $-PO_3H_2$, $-OSO_3H$, $-OPO_3H_2$, $-B(OH)_2$ and -NHOH, wherein the aryl of the $(C_6\text{-}C_{18})$aryl or $(C_6\text{-}C_{18})$aryl$(C_1\text{-}C_{18})$alkyl is optionally further substituted with one or more substituents selected from the group consisting of hydroxy, halo, $(C_1\text{-}C_3)$alkyl, halo$(C_1\text{-}C_3)$alkyl, cyano, nitro, $(C_1\text{-}C_3)$alkoxy and thio$(C_1\text{-}C_3)$alkyl;

R' is hydrogen or $(C_1\text{-}C_{18})$alkyl, wherein $(C_1\text{-}C_{18})$alkyl is optionally substituted with one or more acidic substituents selected from the group consisting of $-CO_2H$, $-SO_3H$, $-PO_3H_2$, $-OSO_3H$, $-OPO_3H_2$, $-B(OH)_2$ and -NHOH; and

X is an amino acid, wherein the amino acid is oriented to form an amide linkage with

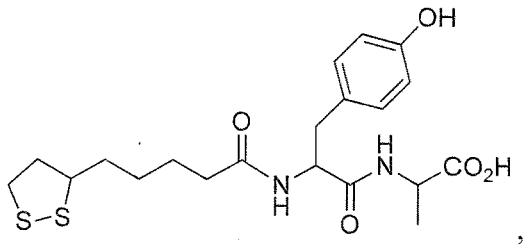


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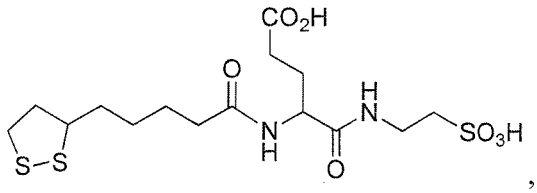
provided that the compound of Structural Formula (Ia) is not *N*-lipoyl-glutamylalanine, *N*-lipoyl-aspartylglycine, or *N*-lipoyl-glutamylglycine.

173. The use of Claim 152, wherein the compound is an (R)-lipoyl stereoisomer of a compound represented by Structural Formula (Ia), or a pharmaceutically acceptable salt thereof, and the enantiomeric excess or diastereomeric excess of the compound or pharmaceutically acceptable salt thereof is at least ~~or about~~ 90%.

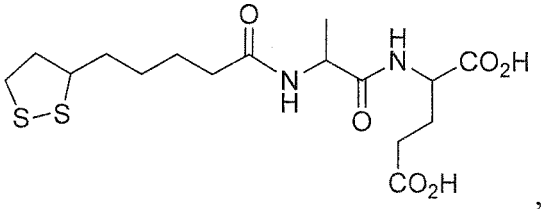
184. The use of any one of Claims 151 to 173, wherein the compound is represented by one of the following structural formulas:



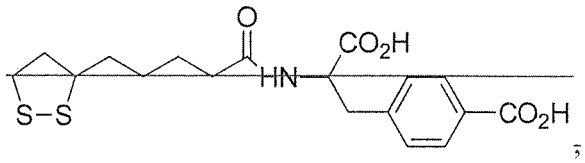
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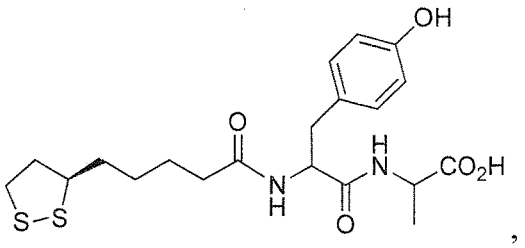


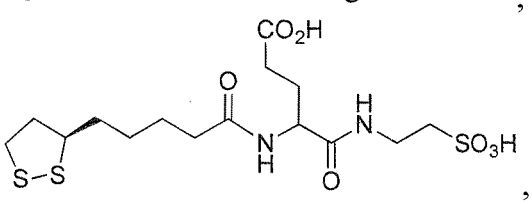
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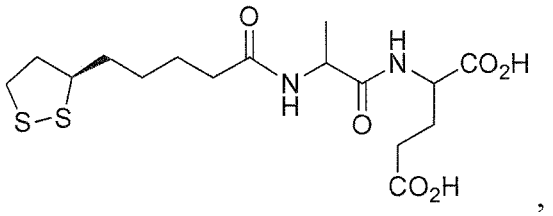


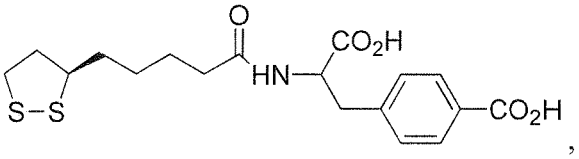
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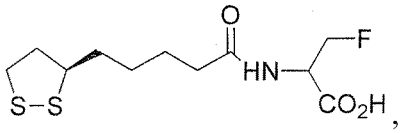


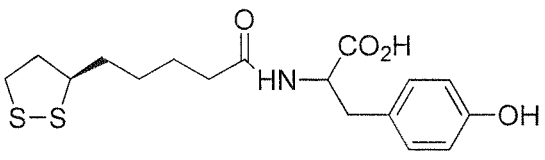


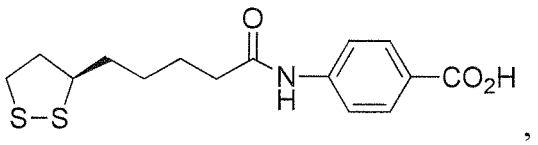




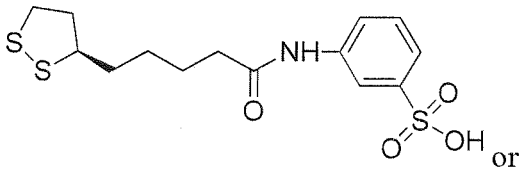




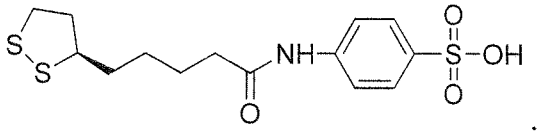




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or



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or a pharmaceutically acceptable salt thereof.

195. The use of any one of Claims 154 to 184 wherein:

the ischemia-reperfusion injury is selected from the group consisting of a cerebrovascular ischemia-reperfusion injury, a renal ischemia-reperfusion injury, a hepatic ischemia-reperfusion injury, an ischemia-reperfusion cardiomyopathy, a cutaneous ischemia-reperfusion injury, a bowel ischemia-reperfusion injury, an intestinal ischemia-reperfusion injury, a gastric ischemia-reperfusion injury, a pulmonary ischemia-reperfusion injury, a pancreatic ischemia-reperfusion injury, a skeletal muscle ischemia-reperfusion injury, an abdominal muscle ischemia-reperfusion injury, a limb ischemia-reperfusion injury, ischemia-reperfusion colitis, a mesenteric ischemia-reperfusion injury and a silent ischemia-reperfusion injury; or

the ischemic injury is a myocardial ischemic injury; or

the ischemic injury is consequent to an ischemia selected from the group consisting of a cardiovascular ischemia, a cerebrovascular ischemia, a renal ischemia, a hepatic ischemia, a ischemia-reperfusion cardiomyopathy, a cutaneous ischemia, a bowel ischemia, an intestinal ischemia, a gastric ischemia, a pulmonary ischemia, a pancreatic ischemia, a skeletal muscle ischemia, an abdominal muscle ischemia, a limb ischemia, an ischemia-reperfusion colitis, a mesenteric ischemia and a silent ischemia. or