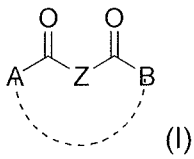
Claims

1. A compound according to the invention is given by Formula (I)

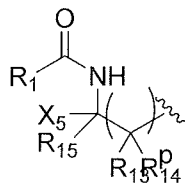


(I)

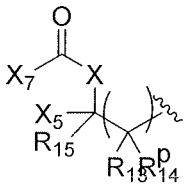
or a pharmaceutically acceptable salt thereof, wherein the dotted bond between A and B denotes an optional bond so as to form a ring closed structure, and wherein

Z is selected from $-CH_2-CH_2-$,

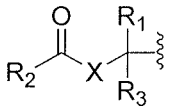
A is -SR, and R is



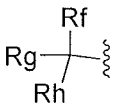
or



B is selected from -O-R', -SR''' or -OH; and R' is selected from the formula (II) and (IX) below:

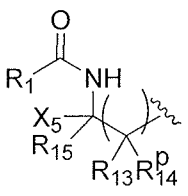
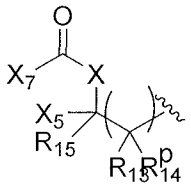


(II)



(IX)

R', and R''' are independently different or identical and is selected from formula below:


(VII) or


R_1 and R_3 are independently different or identical and are selected from H, Me, Et, propyl, i-propyl, butyl, iso-butyl, t-butyl, O-acyl, O-alkyl, N-acyl, N-alkyl, Xacyl, CH_2Xalkyl, CH_2X-acyl, F, CH_2COOH, CH_2CO_2alkyl,

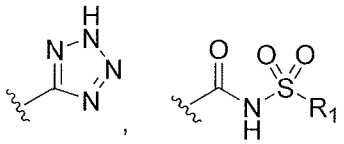
X is selected from O, NH, S,

R_2 is selected from Me, Et, propyl, i-propyl, butyl, iso-butyl, t-butyl, $C(O)CH_3$, $C(O)CH_2C(O)CH_3$, $C(O)CH_2CH(OH)CH_3$,

p is an integer and is 1 or 2

R_6 is selected from H, Me, Et, propyl, i-propyl, butyl, iso-butyl, t-butyl, acetyl, acyl, propionyl, benzoyl, or formula (II), or formula (VIII)

X_5 is selected from -H, Me, Et, propyl, i-propyl, butyl, iso-butyl, t-butyl, -COOH, $-C(=O)XR_6$, $CONR_1R_3$ or is formula



X_7 is selected from R_1, $-NR_1R_3$,

R_9 is selected from H, Me, Et or $O_2CCH_2CH_2COXR_8$

R_8 is selected from H, Me, Et, propyl, i-propyl, butyl, iso-butyl, t-butyl, acetyl, acyl, propionyl, benzoyl, or formula (II),

R_d is selected from CH_2Xalkyl, CH_2Xacyl, where X = O, NR_6 or S,

R_{13}, R_{14} and R_{15} are independently different or identical and are selected from H, Me, Et, propyl, i-propyl, butyl, iso-butyl, t-butyl, -COOH, O-acyl, O-alkyl, N-acyl, N-alkyl, Xacyl, CH_2Xalkyl;

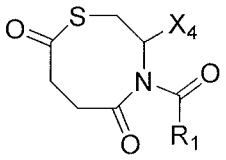
R_f , R_g and R_h are independently different or identical and are selected from Xacyl, -CH_2Xalkyl, -CH_2X-acyl and R_9,

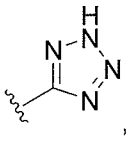
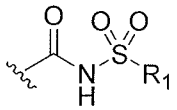
alkyl is selected from Me, Et, propyl, i-propyl, butyl, iso-butyl, t-butyl,

acyl is selected from formyl, acetyl, propionyl, isopropionyl, byturyl, tert-butyryl, pentanoyl, benzoyl,

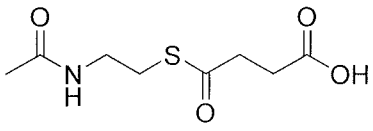
and

when the dotted bond between A and B is present, the compound according to formula (I) is

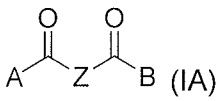


wherein X_4 is selected from –COOH, -C(=O)XR_6,  , 

with the proviso that the compound is not



2. A compound according to claim 1 having Formula (IA)

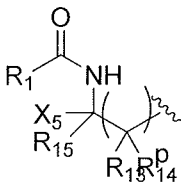


(IA)

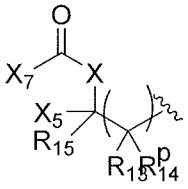
or a pharmaceutically acceptable salt thereof, wherein thereof, wherein

Z is $–CH_2-CH_2-$,

A is -SR, and R is

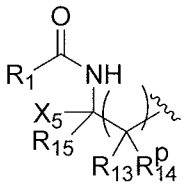


or

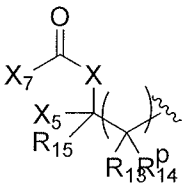


B is selected from -O-R', -SR''' or -OH; and

R', and R''' are independently different or identical and is selected from one or the formulas below:



(VII) or



R_1 and R_3 are independently different or identical and are selected from H, Me, Et, propyl, O-Me, O-Et, O-propyl,

X is selected from O, NH, S,

p is an integer and is 1,

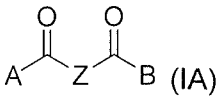
R_6 is selected from H, Me, Et,

X_5 is selected from -H, Me, Et, -COOH, -C(=O)XR_6, $CONR_1R_3$

X_7 is selected from R_1, -NR_1R_3,

R_{13}, R_{14} and R_{15} are independently different or identical and are selected from H, Me, Et, propyl, i-propyl, butyl, iso-butyl, t-butyl, -COOH, O-acyl, O-alkyl, N-acyl, N-alkyl, Xacyl, CH_2Xalkyl, wherein alkyl and acyl are as defined herein before.

3. A compound according to claim 1 or 2 having Formula (IA)

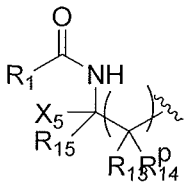


(IA)

or a pharmaceutically acceptable salt thereof, wherein

Z is $–CH_2$-CH_2-,

A is -SR, and R is



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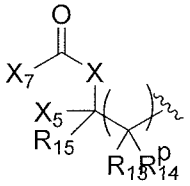
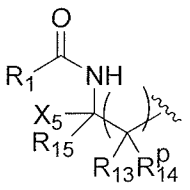
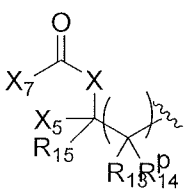


B is selected from -O-R', -SR'" or -OH; and

R', and R'" are independently different or identical and is selected from one or the formulas below:



(VII) or


R_1 and R_3 are independently different or identical and are selected from H, Me, Et, propyl, O-Me, O-Et, O-propyl,

X is selected from O, NH, S,

p is an integer and is 1,

R_6 is selected from H, Me, Et,

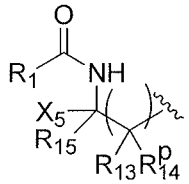
X_5 is selected from -H, Me, Et, -COOH, -C(=O)OR_6, $CONR_1R_3$,

X_7 is selected from R_1, -NR_1R_3,

R_{13}, R_{14} and R_{15} are independently different or identical and are selected from H, Me, Et, -COOH.

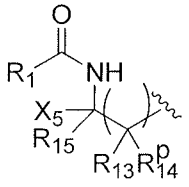
4. A compound according to any one of the preceding claims, wherein B is OH or SR'''.

5. A compound according to any one of the preceding claims, wherein B is OH or SR''', where R''' is

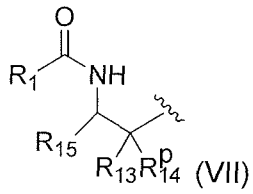


6. A compound according to any one of the preceding claims, wherein B is OH.

7. A compound according to any of the preceding claims, wherein R and/or R''' is

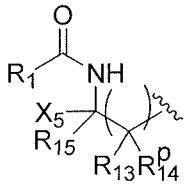


and p=1 and X_5 is –H such that formula (VII) is

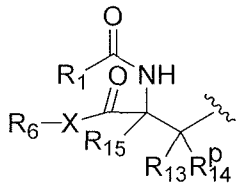


(VII)

8. A compound according to any of claims 1-6, wherein R and/or R''' is

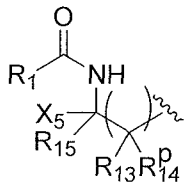


and p=1 and X_5 is $COXR_6$ such that formula (VII) is



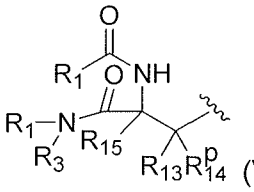
(VII)

9. A compound according to any of claims 1-6, wherein R and/or R''' is



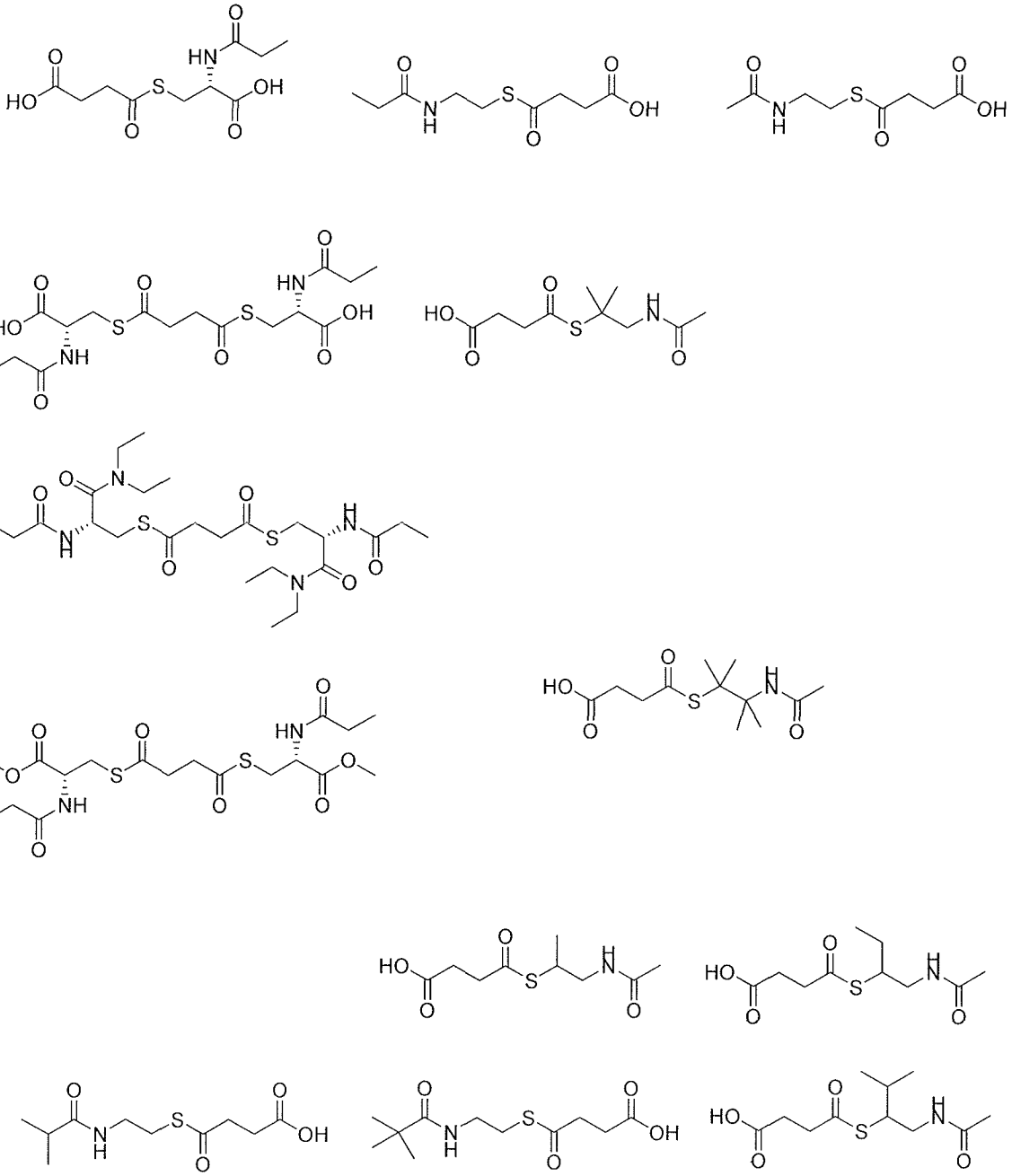
(VII)

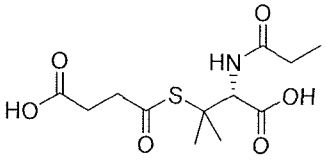
and p=1 and X_5 is $CONR_1R_3$ such that formula (VII) is

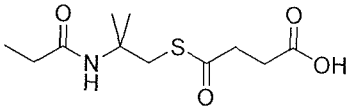


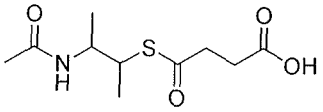
(VII)

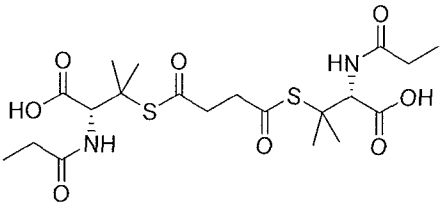
10. A compound according to any one of the preceding claims, wherein the compound is selected from:

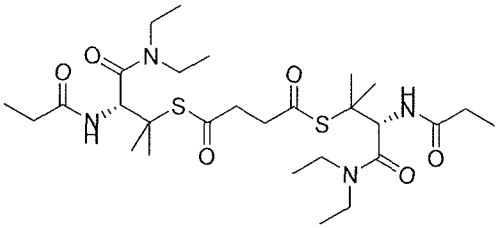


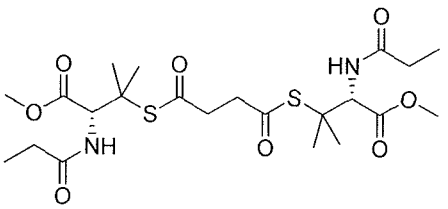


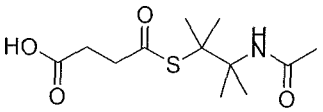


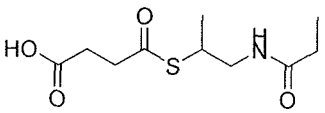


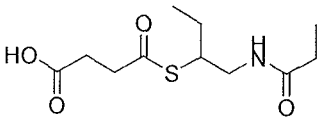


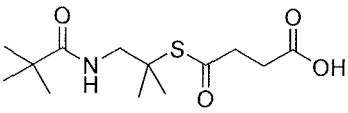


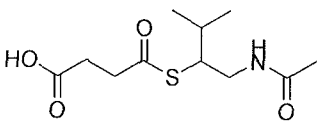


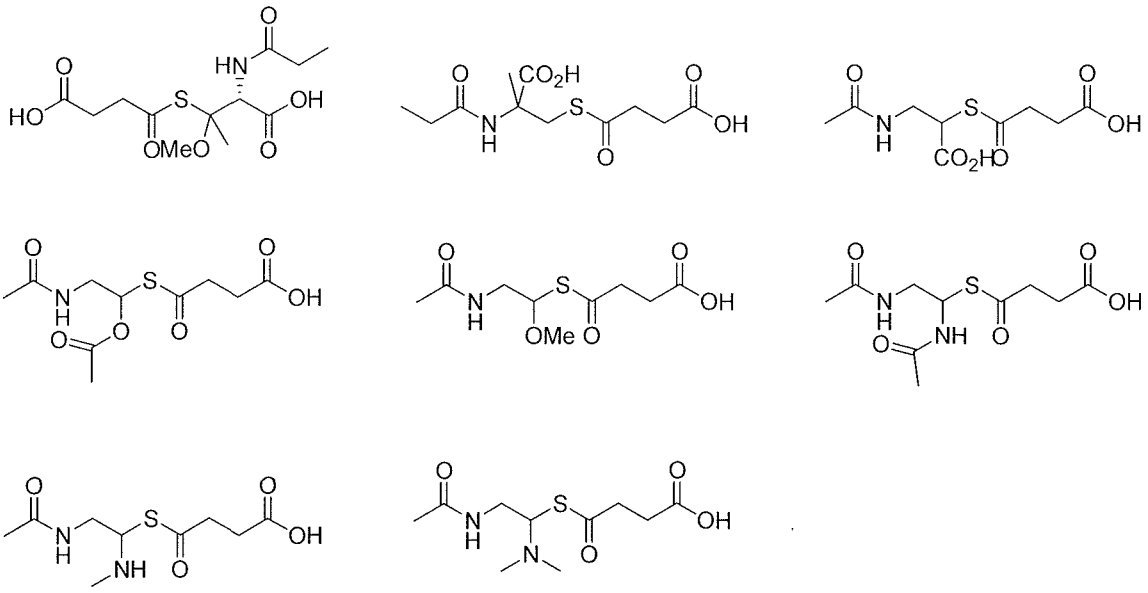












11. A compound according to any of claims 1-10 for use in medicine.

12. A compound according to any of claims 1-10, for use in cosmetics.

13. A compound according to any of claims 1-10 for use in the treatment of or prevention of metabolic diseases, or in the treatment of diseases of mitochondrial dysfunction or disease related to mitochondrial dysfunction, treating or suppressing of mitochondrial disorders, stimulation of mitochondrial energy production, treatment of cancer and following hypoxia, ischemia, stroke, myocardial infarction, acute angina, an acute kidney injury, coronary occlusion and atrial fibrillation, or to avoid or counteract reperfusion injuries.

14. A compound according for use according to claim 13, wherein the medical use is prevention or treatment of mitochondrial side-effects induced by an anti-diabetic substance.

15. A composition comprising a compound of Formula (I) as defined according any of claims 1- 10 and one or more pharmaceutically or cosmetically acceptable excipients.

16. A composition according to claim 15 designed to be administered parenterally, orally, topically, via a medical device, by inhalation or via injection.

17. A compound according to any of claims 1-10 for use in the treatment or prevention of lactic acidosis.