CLAIMS

1. A composition comprising one or more inhibitors inhibiting at least two of cyclooxygenase-1 (COX-1), cyclooxygenase-2 (COX-2) and lipoxygenase in senescent cells which are characterized by increased intracellular levels of at least one of lysophosphatidylcholine, arachidonic acid and phospholipase A2 activity, for use in the treatment of a senescence-related disease or condition, wherein said composition does not comprise quercetin.

2. A composition comprising one or more inhibitors inhibiting an enzyme with arachidonate-CoA ligase activity, in senescent cells which are characterized by increased intracellular levels of at least one of lysophosphatidylcholine, arachidonic acid and phospholipase A2 activity, which enzyme is selected from the group consisting of long-chain-fatty-acid-CoA ligase (ACSL) 1, ACSL3, ACSL4, ACSL5, ACSL6, SLC27A2 or ACSBG2, for use in the treatment of a senescence related disease or condition.

3. The composition for use according to claim 2, comprising one or more inhibitors inhibiting an enzyme with arachidonate-CoA ligase activity, selected from the group consisting of long-chain-fatty-acid-CoA ligase (ACSL) 1, ACSL3, ACSL4, ACSL5, ACSL6, SLC27A2 or ACSBG2, and at least one inhibitor of COX-1, COX-2 or lipoxygenase, wherein said composition does not comprise quercetin.

4. The composition for use according to any one of claims 1 to 3, wherein at least one of the one or more inhibitors is COX-1 or COX-2 inhibitor selected from the group consisting of acetylsalicylic acid, diclofenac, celecoxib, ibuprofen, acetaminophen, indomethacin, nabumetone, ketorolac, tenoxicam, tolmetin, piroxicam, fenoprofen, etodolac, naproxen, diflunisal, suprofen, bromfenac, ketoprofen, dihomo-gamma-linolenic acid, icosapent, fluriprofen, mefenamic acid, salsalate, sulindac, salicylic acid, lumiracoxib, O-acetyl-L-serine, phenacetin, fluriprofen methyl ester, metamizole, nitroaspirin, meloxicam, flufenamic acid, oxaprozin, tiaprofenic acid, magnesium salicylate, diethylcarbamazine, lornoxicam, carprofen, phenylbutazone, nepafenac, antipyrine, antrafenine, choline magnesium trisalicylate, triflusal, niflumic acid, dexibuprofen, aceclofenac, acemetacin, droxicam, loxoprofen, tolfenamic acid,

dexketoprofen trometamol, talniflumate, propacetamol, trolamine salicylate, phenyl salicylate, bufexamac, glycol salicylate, menthyl salicylate, lenalidomide, rofecoxib, valdecoxib, cimicoxib, chlorphenesin, clodronic acid, seliciclib, drospirenone, pomalidomide, parecoxib, firocoxib, aclofenac, adapalene, thalidomide, etoricoxib, robenacoxib, asaraldehyde, zaltoprofen, deracoxib, pranoprofen, amfenac sodium monohydrate, ampiroxicam, NS-398, bismuth subsalicylate, diclofenac diethylamine, trometamol, rutaecarpine, salicin, fenbufen, xanthohumol, flunixin meglumin and nimesulide.

5. The composition for use according to any one of claims 1 and 3 to 4, wherein one of the one or more inhibitors is a lipoxygenase inhibitor selected from the group consisting of MK886, zileuton, masoprocol, diethylcarbamazine, azelastine, benoxaprofen, nordihydroguaiaretic acid, abietic acid, esculetin, montelukast, minocycline, MLN-977, rhein, diacerein, nabiximols, fostamatinib, AM103, DG031, fiboflapon, AA-861 and atreleuton.

6. The composition for use according to any one of claims 1 and 3 to 5, wherein one or more inhibitors are dual cyclooxygenase and lipoxygenase inhibitors, preferably selected from the group consisting of licofelone, darbufelone, CI-987, S-2474, KME-4, Chebulagic acid, balsalazide, mesalazine, sulfasalazine, aminosalicylic acid, meclofenamic acid, morniflumate diarylpyrazole derivatives, thieno[2,3-b]pyridine derivatives, N-substituted 5-aminosalicylicylamides, flavocoxid, indolizine derivatives, LQFM-091, hyperforin, celastrol, BW755C, tepoxalin, b-boswellic acid, D-002, 2,3-diarylxanthones, phenidone and ER-34122.

7. The composition for use according to any one of claims 2 to 6, wherein the one or more inhibitors capable of inhibiting an enzyme with arachidonate-CoA ligase activity are inhibitors selected from the group consisting of triacsin A, triacsin B, triacsin C, triacsin D, N-ethylmaleimide, 2-fluoropalmitic acid, troglitazone, ciglitazone, pioglitazone, rosiglitazone, 5-bromo-5′-phenylspiro[3H-1,3,4-thiadiazole-2,3′-indoline]-2-one, CB2, CB5, CB6, CB16, NCI-3, and 2-(6-HYDROXY-1,3-BENZOTHIAZOL-2-YL)-1,3-THIAZOL-4(5H)-ONE.

8. The composition for use according to any one of claims 1 to 7, wherein the composition comprises an additional compound selected from the group consisting of

a) a natural compound, preferably selected from the group consisting of turmeric, rosemary, ginger, oregano, resveratrol, curcumin, cannabinoids, ginseng, saponins, terpenoids, flavonoids, polyphenols, ginkgo biloba, capsaicin, genistein, kaempferol, wherein said composition does not comprise quercetin;

b) an inhibitor of cytochrome P450, preferably selected from the group consisting of sulfaphenazole, avasimibe, benzbromarone, rosiglitazone, troglitazone, cervistatin, warfarin, pioglitazone, lapatinib, trimethoprim, zafirlukast, amodiaquine, nicardipine, simvastatin, fluvastatin , loratadine, ethinylestradiol, irbesartan, quinine, sorafenib, eltrombopag, losartan, licofelone, amitriptyline, atorvastatin, mefenamic acid, meloxicam, piroxicam, erlotinib, pazopanib, diethylstilbestrol, enzalutamide, ponatinib, dabrafenib, enasidenib, lovastatin, montekulast, ketoconazole, felodipine, candesartan cilexetil, clotrimazole, mometasone, salmeterol, raloxifene, fenofibrate, levothyroxine, tamoxifen, oxybutynin, medroxyprogesterone acetate, nifedipine, liotrix, amlodipine, bezafibrate, chloramphenicol, cyclosporin, cimetidine, clopidogrel, cholecalciferol, delavirdine, dextropropoxyphene, etoposide, isoniazid, ketoprofen, metronidazole, nilutamide, nilvadipine, paroxetine, phenelzine, pravastatin, propafenone, pyrimethamine, rofecoxib, rutin, saquinavir, sulfamethoxazole, sulfinpyrazone, tegaserod, terfenadine, thioridazine, ticlopidine, tioconazole, triazolam, troleandomycin, valproic acid, abiraterone, vismodegib, regorafenib, trametinib, idelalisib, lopinavir, celecoxib, efavirenz, rabeprazole, teriflunomide, crisaborole, belinostat, topiroxostat, candesartan, letermovir, rucaparib, opicapone, nabilone, fluvoxamine, fluticasone, fluticasone furoate, fluticasone propionate, bosutinib, cabozantinib, genistein, lenvatinib, atazanavir, bexarotene, deferasirox, quinidine, mifepristone, vemurafenib, sildenafil, diclofenac, fluoxetine, valdecoxib, voriconazole, etodolac, sertraline, glyburide, acenocoumarol, rosuvastatin, imatinib, clozapine, diazepam, progesterone, omeprazole, valsartan, bortezomib, nevirapine, azelastine, lornoxicam, phenylbutazone, etravirine, leflunomide, sitaxentan, aminophenazone, verapamil, etoricoxib, propofol, sulfamoxole, dicoumarol, diltiazem, histamine, moclobemide, selegiline, parecoxib, doconexent, acetyl sulfisoxazole, fluconazole, pantoprazole, desloratadine, miconazole, amiodarone, gemfibrozil, probenecid, teniposide, sulfadiazine, capecitabine, fluorouracil, tranylcypromine, anastrozole, atovaquone, cyclizine, dexfenfluramine, disulfiram, epinephrine, eprosartan, flecainide, indinavir, methazolamide, nelfinavir,

olanzapine, pranlukast, promethazine, sulfadimethoxine, sulfamethizole, sulfanilamide, sulfapyridine, methimazole, tolcapone, bicalutamide, armodafinil, agomelatine, noscapine, clevidipine, sulconazole, gefitinib, ticagrelor, ceritinib, floxuridine, lifitegrast, rhein, diacerein, zucapsaicin, stiripentol, lobeglitazone, dosulepin, manidipine, cimicifuga racemose, curcumin, felbamate, piperine, safinamide, irponiazid, oritavancin, masorpocol and pegvisomant;

c) an inhibitor of long-chain-fatty-acid-CoA ligase 4 (ACSL4;

d) an inhibitor of a lysophosphatidylcholine acyltransferase; and/or

e) an inhibitor of a fatty acid elongase.

9. The composition for use according to claim 8, wherein the inhibitor of ACSL4 is selected from the group consisting of triacsin A, triacsin B, triacsin C, triacsin D, N-ethylmaleimide, 2-fluoropalmitic acid, troglitazone, ciglitazone, pioglitazone and rosiglitazone.

10. The composition for use according to claim 8, wherein the inhibitor of a lysophosphatidylcholine acyltransferase is an inhibitor of LPCAT1, LPCAT2, LPCAT3, LPCAT4, MBOAT2 and/or MBOAT7.

11. The composition for use according to claim 10, wherein the inhibitor of a lysophosphatidylcholine acyltransferase is an inhibitor of LPCAT1, LPCAT2, LPCAT3, LPCAT4, MBOAT2 and/or MBOAT7 and is selected from the group consisting of *N*-phenylmaleimide derivatives, TSI-01 and thimerosal.

12. The composition for use according to claim 8, wherein the inhibitor of a fatty acid elongase is an inhibitor of ELOVL2, ELOVL4 and/or ELOVL5.

13. The composition for use according to claim 12, wherein the inhibitor of a fatty acid elongase is an inhibitor of ELOVL2, ELOVL4 and/or ELOVL5 selected from the group consisting of cycloate, adenosine 5'-hexadecylphosphate, endo-1k, (S)-1y and compound 37, 5,5-dimethyl-3-(5-methyl-3-oxo-2-phenyl-2,3-dihydro-1H-pyrazol-4-yl)-1-phenyl-3-(trifluoromethyl-3,5,6,7-tetrahydro-1H-indole-2,4-dione) and (3-endo)-3-(phenylsulfonyl)-*N*-[4-(trifluoromethyl)phenyl]-8-azabicyclo[3.2.1]octane-8-carboxamide.

14. The composition for use according to any one of claims 1 to 13, wherein the composition comprises an additional compound selected from the group consisting of

a) an inhibitor of ATP synthases;

b) an inhibitor of ADP/ATP translocases;

c) an inhibitor of glycolysis.

15. The composition for use according to claim 14, wherein the inhibitor of ATP synthases is selected from the group consisting of oligomycin A, inositol nicotinate, bedaquiline, efrapeptins, leucinostatins, tentoxin, tentoxin derivates, angiostatin, enterostatin, melittin, IF_1, Syn-A2, Syn-C, resveratrol, piceatannol, diethylstilbestrol, 4-acetoamido-4'-isothiocyanostilbene-2,2'-disulfonate, 4,4'-D-isothiocyanatostilbene-2,2-disulfonic acid, kaempferol, morin, apigenin, genistein, biochanin A, daidzein, epicatechin gallate, epigallocatechin gallate, proanthocyanidin, curcumin, phloretin, theaflavin, tannic acid, 4-hydroxy-estradiol, 2-hydroxy-estradiol, 17α-estradiol, 17β-estradiol, α-zearalenol, β-zearalenol, oligomycin, venturicidin, apoptolidin, ossamycin, cytovaricin, peliomycin, tributyltin chloride, tricyclohexyltin hydroxide, triethyltin sulfate, triphenyltin chloride, dimethyltin 3-hydroxyflavone chloride, diethyltin 3-hydroxyflavone chloride, dibuthyltin 3-hydroxyflavone bromide, dioctyltin 3-hydroxyflavone chloride, diphenyltin 3-hydroxyflavone chloride, diethyltin 3,5,7,2',4'-pentahydroxyflavone chloride, dibutyltin 3,5,7,2',4'-pentahydroxyflavone bromide, diphenyltin 3,5,7,2',4'-pentahydroxyflavone chloride, tributyltin 3-hydroxyflavone, triethyllead, aurovertin, citreoviridin, asteltoxin, rhodamine B, rhodamine 123, rhodamine 6G, rosaniline, malachite green, brilliant green, quinacrine, quinacrine mustard, acridine orange, coriphosphine, pyronin Y, dequalinium, safranin O, Nile blue A, ethidium bromide, tetracaine, dibucaine, procaine, lidocaine, chlorpromazine, trifluoperazine, procainamide, propranolol, octyl guanidine, 1-dansyl amido-3-dimethypropylamine compounds, cetyltrimethylammonium, spermine, spermidine, bathophenan throline-metal chelate, 4,4-diphenyl-2,2-bipyridine, 3-(2-pyridyl)-5,6-diphenyl-1,2,4-triazine, atrazine, atrazine amino derivative, arsenate, aluminium fluoride, beryllium fluoride, scandium fluoride, vanadate, magnesium fluoride, sulfite, thiophosphate, azide, ANPP, phenylglyoxal, butanedione, dansyl chloride, 1-fluoro-2,4-dinitrobenzene, dicarbopolyborate, almitrine, 5-hydroxy-1,2-naphtalene dicarboxylic anhydride, R207910, spegazzinine, n-butanol, tetrachlorosalicylanilide, dihydrostreptomycin, suramin, Bz-423, DMSO, hypochlorous acid, DDT, diazoxide, HNB, N-sulfonyl or N-alkyl substituted tetrahydrobenzodiazepine derivatives, 4-(N-arylimidazole)-substituted benzopyran derivatives, N-[1-aryl-2-(1-imidazolo)ethyl]-cyanoguanidine derivatives, N-

[1-aryl-2-(1-imidazolo)ethyl]-acylguanidine derivatives, O-[1-aryl-2-(1-imidazolo)ethyl]-thiourethane derivatives, dio-9 complex, ethanol and zinc.

16. The composition for use according to claim 14, wherein the inhibitor of ADP/ATP translocases selected from the group consisting of clodronic acid, ibipinabant, atractyloside, carboxyatractyloside, bongkrekic acid, isobongkrekic acid, MT-21, closantel, CD437, leelamine, L923-0673, IMD 0354, PI32-0333, S899542, nonactin and S838462.

17. The composition for use according to claim 14, wherein the inhibitor of glycolysis is selected from the group consisting of 2-deoxy-D-glucose, lonidamine, bromopyruvic acid, phloretin, STF-31, WZB117, 3PO, 3-bromopyruvate, dichloroacetate, oxamic acid, NHI-1, oxythiamine, imatinib, glucosamine, 6-aminonicotinamide, genistein, 5-thioglucose, mannoheptulose, α-chlorohydrin, ornidazole, oxalate, glufosfamide, N-(phosphonacetyl)-L-aspartate, 6-methylmercaptopurine riboside, CGP 3466B maleate, sodium monofluorophosphate, DASA-58, DL-serine, dichloroacetic acid, sodium dichloroacetate, nitrofural, 6-AN, fasentin, benserazide, astraglin, resveratrol, chrysin, GEN-27, apigenin, bis-2-(5-phenylacetamido-1,3,4-thiadiazol-2-yl)ethyl sulfide, CB-839, azaserine, acivicin, 6-diazo-5-ox-L-norleucine, thiazolidine-2,4-dione derivatives, compound 968, R-lipoic acid, 1,3,4-thiadiazole compounds, 2-chloropropionate, Nov3r, AZD7545, Pfz3, radicicol, mitaplatin, mito-DCA, phenylbutyrate, 4,5-diarylisoxazoles, VER-246608, betulinic acid, CPI-613, M77976, aromatic DCA derivatives, furan and thiophene carboxylic acids, ritonavir, FX11, oxamate, D-fructose-6-phosphate, 6-phosphogluconic acid, N-bromoacetyl-aminoethyl phosphate, 2-carboxyethylphosphonic acid, N-hydroxy-4-phosphono-butanamide, 2-phosphoglyceric acid, iodoacetate, gossypol, benzene hexacarboxylic acid, 3-phosphoglyceric acid, phosphonoacetohydroxamic acid, 2-phospho-D-glyceric acid, TLN-232 and CAP-232.

18. Use of the composition according to any one of claims 1 to 17 in the manufacture of a medicament for the treatment of a cardiovascular disease, atherosclerosis, cancer, osteoporosis, osteoarthritis, neurological disorders, dementia, cataract, kidney disease, retinopathy, diabetes, lung fibrosis, intervertebral disc,degeneration,, age-related muscular atrophy, hair loss or skin aging.

19. Use of the composition according to any one of claims 1 to 17 for use in the manufacture of a medicament for the treatment and/or prophylactic treatment of senescence-associated scar formation and fibrosis.

20. Use of the composition according to any one of claims 1 to 17, in the manufacture of a medicament for the treatment of side effects of chemotherapy and prevents or delays tumor relapse.

21. An in vitro method of identifying senescent cells in a subject, comprising the steps of

a) providing a sample of said subject,

b) determining the intracellular level of at least one of lysophosphatidyl-choline, arachidonic acid and/or phospholipase A2 activity in said sample,

c) comparing the level of b) to a reference level, wherein the reference level is the intracellular level of at least one of lysophosphatidylcholine, arachidonic acid and/or phospholipase A2 activity in non-senescent cells,

and wherein an increase of at least 2-fold in the level of lysophosphatidylcholine, arachidonic acid and/or phospholipase A2 activity is indicative of the presence of senescent cells in said sample.

22. A method of screening for candidate compounds for eliminating senescent cells, comprising the steps of

a) bringing at least one test compound in contact with a sample of senescent cells,

b) measuring the intracellular level of arachidonic acid, and/or measuring apoptosis, and/or measuring cell viability, and

c) selecting the test compounds which cause an intracellular accumulation of arachidonic acid, increased apoptosis and/or reduced cell viability in the senescent cells contacted with the test compound compared to untreated senescent cells.