Figure S.1 Raybio human cytokine antibody array Array

Lean Adult Sample 1

Lean Adult Sample 2

Lean Elderly Sample 3

Lean Elderly Sample 4

Obese Adult Sample 5

Obese Adult Sample 6

Obese Elderly Sample 7

Obese Elderly Sample 8
**Figure S.2. Human gene expression analysis**

| Gene symbol-Assay ID | Gene name |
|----------------------|-----------|
| Senescence markers   |           |
| CDKN2A-Hs00923894_m1 | Cyclin Dependent Kinase Inhibitor 2A |
| GLB1-Hs01035168_m1  | Galactosidase Beta 1 |
| TP53-Hs01034249_m1  | Tumor Protein P53 |
| Adipocyte differentiation markers | |
| FABP4-Hs01086177_m1 | Fatty Acid Binding Protein 4 |
| FASN-Hs01005622_m1  | Fatty Acid Synthase |
| LPL-Hs00173425_m1   | Lipoprotein Lipase |
| PLIN1-Hs00160173_m1 | Perilipin 1 |
| PPARG-Hs0115513_m1  | Peroxisome Proliferator Activated Receptor Gamma |
| Osteocyte differentiation markers | |
| ALPL-Hs01029144_m1  | Alkaline Phosphatase |
| COL1α1-Hs00164004_m1| Collagen Type I Alpha 1 Chain |
| RUNX2-Hs01047973_m1 | RUNX Family Transcription Factor 2 |
| SPP1-Hs00959010_m1  | Secreted Phosphoprotein 1/Osteopontin |
| Condrocyte differentiation markers | |
| COL1α1-Hs00164004_m1| Collagen Type I Alpha 1 Chain |
| COMP-Hs00164359_m1  | Cartilage Oligomeric Matrix Protein |
| Metabolism markers   |           |
| GYS1-Hs00157863_m1  | Glycogen Synthase 1 |
| GBE1-Hs00609186_m1  | 1,4-alpha-Glucan Branching Enzyme 1 |
| HK2-Hs00606086_m1   | Hexokinase 2 |
| LDHb-Hs00929956_m1  | Lactate Dehydrogenase B |
| OGDH-Hs01081865_m1  | Alpha-ketoglutarate dehydrogenase |
| PDK4-Hs01037712_m1  | Pyruvate dehydrogenase kinase, isozyme 4 |
| PFKM-Hs00175997_m1  | Phosphofructokinase M |
| PPP1R3C-Hs00193642  | Protein Phosphatase 1 Regulatory Subunit 3C/Protein Targeting To Glycogen (PTG) |
| PYGL-Hs00958087_m1  | Glycogen Phosphorylase L |
| SDHb-Hs01042482_m1  | Succinate dehydrogenase b |
| SLC2A1/GLUT1-Hs00892681_m1 | Solute Carrier Family 2 Member 1/Glucose Transporter Type 1 |
| SLC2A3/GLUT3-Hs00892681_m1 | Solute Carrier Family 2 Member 3/Glucose Transporter Type 3 |
| Inflammation markers |           |
| CCL2-Hs00234140_m1  | C-C Motif Chemokine Ligand 2 |
| IL1B-Hs01555410_m1  | Interleukin 1 Beta |
| IL6-Hs00174131_m1   | Interleukin 6 |
| TNFA-Hs00174128_m1  | Tumor necrosis factor alpha |
| Sirtuins             |           |
| SIRT1-Hs01009005_m1 | Sirtuin 1 |
| SIRT6-Hs00213036_m1 | Sirtuin 6 |

Results were calculated using the comparative Ct method and expressed relative to the expression of the housekeeping genes cyclophilin 1A (PPIA) (Hs04194521_s1) and 18S (Hs03928985_g1)
Table S.1. Anthropometric and biochemical variables from the cohorts used to obtain human adipose-derived mesenchymal stromal cells (hASCs)

|                      | Lean Adult | Lean Elderly | Obese Adult | Obese Elderly |
|----------------------|------------|--------------|-------------|---------------|
| n                    | 29         | 16           | 30          | 8             |
| Sex (male/female)    | 12/17      | 10/6         | 17/13       | 0/8           |
| Age (years)          | 45.3±9.8 b,d | 70.9±6.7 a,c | 48.7±8.5 b,d | 72±4.7 a,c    |
| BMI (kg/m²)          | 23.6±2.7 c,d | 24.7±2.3 c,d | 34.3±4.5 a,b | 33.3±3.5 a,b  |
| Glucose (mmol/L)     | 4.86±0.97  | 4.81±1.13    | 5.43±0.99   | 5.82±0.94     |
| Total Cholesterol (mmol/L) | 4.69±0.93 | 5.25±1.19    | 5.14±1.19   | 5.20±0.59     |
| HDLc (mmol/L)        | 1.46±0.48  | 1.54±0.34    | 1.20±0.37   | 1.45±0.41     |
| LDLc (mmol/L)        | 2.68±0.90  | 3.26±0.85    | 3.19±0.98   | 3.02±0.49     |
| Triglycerides (mmol/L) | 1.18±0.70 c | 1.09±0.32 c  | 1.89±0.82 a,b | 1.60±0.54    |

Abbreviations
BMI: body mass index; HDLc: high-density lipoprotein cholesterol; LDLc: low-density lipoprotein cholesterol. Results are given as mean±SD. ANOVA followed by post hoc Bonferroni was used to compare means between groups: a P < .05 vs Lean Adult; b P <.05 vs Lean Elderly, c P<.05 vs Obese Adult; d P<:05 vs Obese Elderly
Table S.2. Immunophenotypic profile of undifferentiated human adipose-derived mesenchymal stromal cells (hASCs) isolated from adult and elderly individuals

| Surface markers | Adult % | Adult MFI | Elderly % | Elderly MFI |
|-----------------|--------|----------|-----------|-------------|
| CD34            | 0.52±0.52 | 100±67 | 0.71±0.63 | 130±117 |
| CD73            | 92.63±3.15 | 6187±2985 | 93.29±5.57 | 7825±3533 |
| CD90            | 89.42±8.21 | 11775±8203 | 89.27±9.19 | 12022±11674 |
| CD105           | 70.28±17.15 | 2722±2061 | 78.69±14.66 | 2318±1280 |
| CD14            | 0.33±0.28 | 115±40 | 0.25±0.27 | 96±25 |
| CD31            | 0.54±0.37 | 188±81 | 0.56±0.58 | 234±157 |
| CD45            | 0.29±0.21 | 121±69 | 0.28±0.37 | 132±62.10 |

Human adipose-derived mesenchymal stromal cells obtained from subcutaneous adipose tissue biopsies from Adult and Elderly donors were stained with the panel of antibodies described and analyzed by flow cytometry using 405-nm, 488-nm and 633-nm excitation on the FACSAREA III cytometer (BD). Values are reported as the mean ±SD and means were compared between groups with the Student’s unpaired t-test: a \( P<.05 \) vs Lean Adult

Abbreviation: MFI, mean fluorescence intensity (arbitrary units)