**SUPPLEMENTARY TABLES**

**Supplementary Table 1. Effect of α-Man on body weight of old mice.**

| Week | Y       | O        | L        | H        |
|------|---------|----------|----------|----------|
| 0    | 24.32±2.31 | 40.34±5.37** | 37.92±5.32 | 38.94±4.79 |
| 1    | 24.66±2.41 | 39.26±5.42** | 34.52±4.58 | 34.2±4.71  |
| 2    | 24.66±2.48 | 39.22±5.37** | 34.18±4.27 | 33.68±4.29 |
| 3    | 25.06±2.10 | 39.04±5.40** | 34.34±3.87 | 32.66±6.39 |
| 4    | 26.46±1.63 | 38.94±3.63** | 35.08±3.84 | 31.50±4.88** |
| 5    | 26.54±1.53 | 38.30±3.63** | 34.72±3.68 | 31.14±4.40* |
| 6    | 25.76±1.80 | 37.22±4.03** | 34.56±3.71 | 30.28±4.19* |
| 7    | 26.44±2.14 | 37.02±4.01** | 33.58±3.66 | 30.58±3.16* |
| 8    | 26.00±2.12 | 36.50±3.54** | 32.42±3.15 | 30.48±3.06* |

**P** < 0.01 old mice vs. young mice. *P* < 0.05, **P** < 0.01 α-Man vs. old mice.

**Supplementary Table 2. List of oligonucleotide primer pairs used in qRT-PCR.**

| Gene   | Forward          | Reverse                                |
|--------|------------------|----------------------------------------|
| 18S    | AGCCTGCGGCTTAATTTGAC | CAACTAAGAACGCCCATGCA                   |
| Arg-1  | CTCCAAGGCAAGTTTCTGGAG | AGGAGCTGTTCATTAGGAGACATC               |
| Ccl5   | TGAGGAGCTCTGAGAGGCAGAC | GAGTGGTGTCGGACACATATA                  |
| Ccl11  | AGAGCTGACACGCCTTCTCTCT | GCAGAAGGTGGGTTGAGA                     |
| Cd11c  | CTGGATAGCCTTCTTCTGCTG | GCACTGTGTCGGACAACTC                   |
| Cd206  | CAGGTGTCGGCTCAGGTAAGTG | TGTGTTGAGCTGAAAGGTGA                  |
| Cd68   | CTTATGGAACCATCTTTTCTGCTG | CTTAGCAGCTGTGGACCC                     |
| Cox-2  | CCCACCTCTGCGATGCTCTTC | CATTCCCCACGTTTGTGAC                     |
| Cx3cl1 | CATCCGGTATACGTAAACCA | CAGAAGGCTGTGCTGTTGT                  |
| Cxcl10 | GCTGCCGTGACTTTCCTGCTG | TCTCACTGGAAGCCCTAG                    |
| F4/80  | CCTTGTCATGCGGTCCCTAGCTG | GCAAGAGGACAGAGTTTTCAC                    |
| Ift-γ  | GTCATTGAAAGCCTAGAAAGTTTCTG | CTGGTGTTGTCGGACCTCAAACT              |
| II-1β  | TTGCCTTTGTAAGTTGACCC | TCATCTGAGGCTGAGTGA                   |
| II-6   | CCAGAGATACAAAGAAATATGAGG | ACTCCAGAAGACCAGAGGAATAT             |
| iNos   | CCAAGCCCTCACCACTTCTCCC | CTGTTAGGCTGACACAGAG                   |
| Mcp-1  | CAACTCTGACTGAGCAGCAGTCTC | TAGCCTGACCTCTACTAC                      |
| Mip-1α | CTTCTCTGTACCAGCAGCAGGCTGC | ATTCAGTCCAGGTCAGTGAAGTAT              |
| Tnf-α  | GAGAAGGTCAACCTCCTCTTCTG | GAAGACTCCTCCCAGGTATAT                |

**Supplementary Table 3. List of miRNA primers used in qRT-PCR.**

| miRNA | Company                      | Catalog number      |
|-------|------------------------------|---------------------|
| U6 snRNA RT-PCR primer | Thermo Fisher Scientific | 4427975(ID#001973) |
| miR-155 RT-PCR primer   | Thermo Fisher Scientific   | 4427975(ID#002571) |
| Cel-miR-39              | Thermo Fisher Scientific   | 4427975(ID#000200) |
### Supplementary Table 4. Antibodies used for Western blot and flow cytometry.

| Antibody                  | Source | Vendor                      | Catalog No. |
|---------------------------|--------|-----------------------------|-------------|
| anti-phospho-JNK (Thr183/Tyr185) | Mouse  | Santa Cruz Biotechnology    | sc-6254     |
| anti-JNK                  | Rabbit | Santa Cruz Biotechnology    | sc-571      |
| anti-phospho-p38 (Thr180/Tyr182) | Rabbit | Cell Signaling Technology  | #4511       |
| anti-p38                  | Rabbit | Cell Signaling Technology  | #8690       |
| anti-phospho-ERK (Thr202/Tyr204) | Rabbit | Cell Signaling Technology  | #4370       |
| anti-ERK                  | Rabbit | Cell Signaling Technology  | #4695       |
| anti-phospho-p65 (Ser536) | Rabbit | Cell Signaling Technology  | #3033       |
| anti-p65                  | Rabbit | Cell Signaling Technology  | #8242       |
| anti-phospho-IKKα/β (Ser176/180) | Rabbit | Cell Signaling Technology  | #2697       |
| anti-IKKα                 | Mouse  | Cell Signaling Technology  | #11930      |
| anti-IKKβ                 | Rabbit | Cell Signaling Technology  | #8943       |
| anti-phospho-IkBα (Ser32) | Rabbit | Cell Signaling Technology  | #2859       |
| anti-IkBα                 | Mouse  | Cell Signaling Technology  | #4814       |
| anti-iNOS                 | Rabbit | Cell Signaling Technology  | #13120      |
| anti-COX2                 | Rabbit | Cell Signaling Technology  | #12282      |
| anti-SIRT3                | Rabbit | Cell Signaling Technology  | #5490       |
| anti-AKT                  | Rabbit | Santa Cruz Biotechnology    | sc-8312     |
| anti-phospho-AKT (Ser473) | Rabbit | Santa Cruz Biotechnology    | sc-7985-R    |
| anti-perilipin            | Rabbit | Cell Signaling Technology  | #9349       |
| anti-C608                 | Rabbit | ABclonal                    | A6554       |
| anti-F4/80                | Mouse  | eBioscience                 | 12-4801-82   |
| anti-F4/80                | Mouse  | Santa Cruz Biotechnology    | sc-377009   |
| anti-CD11c                | Mouse  | BD Bioscience               | 557400      |
| anti-CD11c                | Rabbit | ABclonal                    | A1508       |
| anti-CD206                | Mouse  | BioLegend                   | 141708      |
| anti-CD206                | Rabbit | Abcam                       | ab64693     |
| α-tubulin                 | Mouse  | Santa Cruz Biotechnology    | sc-8035     |
| β-actin                   | Rabbit | Cell Signaling Technology  | #8457       |
| GAPDH                     | Rabbit | Santa Cruz Biotechnology    | sc-25778    |
| Histone H3                | Rabbit | Santa Cruz Biotechnology    | sc-10809    |