Supplementary Table 1.
Clinical characteristics of 20 study participants completing the 12-week study prior to NMN supplementation, Related to Table 1.

	Placebo Mean ± SD(10)	NMN Mean ± SD(10)	Between group p-value
Age (year)	70.1±5.6	69.8±2.6	0.520[b]
BMI (kg/m^2)	24.8 ± 1.2	23.7 ± 1.3	0.063[a]
Fat Mass (%)	26.8±4.4	25.1±3.2	0.343[a]
SMI (kg/m^2)	7.79 ± 0.44	7.65 ± 0.39	0.459[a]
Gait Speed (m/sec)	1.31 ± 0.19	1.50 ± 0.20	0.041[a]*
A 30-s Chair-Stand Test (Counts/30sec)	13.5 ± 5.2	14.8 ± 4.0	0.539[a]
Right hand grip strength (kg)	36.0 ± 7.1	40.1 ± 3.2	0.147[b]
Left hand grip strength (kg)	34.8 ± 4.8	36.1 ± 5.6	0.587[a]
HbA1c (%)	5.74 ± 0.32	5.85 ± 0.58	0.939[b]
FBG (mg/dL)	94.4 ± 7.8	99.0 ± 9.0	0.236[a]
HOMA-IR	1.08 ± 0.38	1.35 ± 0.79	0.520[b]
CT L/S ratio	1.15 ± 0.11	1.15 ± 0.12	0.943[a]
Visceral adipose tissue (cm^2)	126.3 ± 38.1	129.3 ± 45.8	0.874[a]

a. Inter-group comparisons were made using an unpaired t-test.
b. Inter-group comparisons were made using Mann–Whitney *U* test.
*P<0.05

Supplementary Table 2.
The effect of NMN on clinical laboratory data (hematology and CRP).

	Placebo Mean ± SD (n)	NMN Mean ± SD (n)	Between group p-value		Placebo Mean ± SD (n)	NMN Mean ± SD (n)	Between group p-value
WBC (x10^{3}counts/μL)				**RBC (x10^{3}counts/μL)**			
Baseline	6.96 ± 1.34 (21)	6.13 ± 1.48 (21)	0.019[b]*	Baseline	476.4 ± 33.6 (21)	490.6 ± 35.6 (21)	0.190[a]
Week 12	5.61 ± 0.78 (10)	4.85 ± 0.87 (10)	0.054[a].	Week 12	462.6 ± 28.2 (10)	464.6 ± 30.9 (10)	0.882[a]
Change from Baseline to Week 12	-1.25 ± 0.87 (10)	-0.75 ± 1.20 (10)	0.416[c]	Change from Baseline to Week 12	-16.8 ± 19.7 (10)	-17.1 ± 14.1 (10)	0.974[c]
Platelet (x10^{4}counts/μL)				**Hemoglobin (g/dL)**			
Baseline	22.8 ± 5.81 (21)	23.0 ± 5.50 (21)	0.850[b]	Baseline	14.7 ± 0.91 (21)	15.2 ± 0.91 (21)	0.091[a].
Week 12	23.3 ± 5.76 (10)	22.2 ± 2.90 (10)	0.606[a]	Week 12	14.4 ± 0.53 (10)	14.5 ± 0.65 (10)	0.555[a]
Change from Baseline to Week 12	0.2 ± 1.90 (10)	-1.0 ± 2.99 (10)	0.272[a]	Change from Baseline to Week 12	-0.4 ± 0.57 (10)	-0.6 ± 0.34 (10)	0.963[c]
CRP (mg/dL)				**Hematocrit (%)**			
Baseline	0.115 ± 0.162 (21)	0.070 ± 0.059 (21)	0.569[b]	Baseline	43.8 ± 2.26 (21)	44.8 ± 2.59 (21)	0.170[a]
Week 12	0.231 ± 0.506 (10)	0.086 ± 0.106 (10)	0.760[b]	Week 12	43.0 ± 1.47 (10)	43.0 ± 2.13 (10)	0.990[a]
Change from Baseline to Week 12	0.162 ± 0.516 (10)	0.043 ± 0.104 (10)	0.344[c]	Change from Baseline to Week 12	-0.8 ± 1.83 (10)	-1.4 ± 1.29 (10)	0.558[c]

a. Inter-group comparisons were made using an unpaired t-test.
b. Inter-group comparisons were made using the Mann–Whitney *U* test.
c. Inter-group comparisons were made using ANCOVA for adjusting the baseline
*P<0.05

Supplementary Table 3.
The effect of NMN on clinical laboratory data (hematology and CRP) (blood chemistry).

	Placebo Mean±SD (n)	NMN Mean±SD (n)	Between group p-value		Placebo Mean±SD (n)	NMN Mean±SD (n)	Between group p-value
TP (g/dL)				**BUN (mg/dL)**			
Baseline	7.31±0.38 (21)	7.46±0.31 (21)	0.191[a]	Baseline	14.1±3.07 (21)	15.1±2.56 (21)	0.241[a]
Week 12	6.90±0.29 (10)	6.98±0.34 (10)	0.576[a]	Week 12	13.9±1.92 (10)	13.4±2.49 (10)	0.670[a]
Change from Baseline to Week 12	7.32±0.40 (10)	7.49±0.34 (10)	0.779[c]	Change from Baseline to Week 12	-0.0±2.72 (10)	-1.2±2.42 (10)	0.388[c]
Albumin (g/dL)				**Creatinine (mg/dL)**			
Baseline	4.30±0.23 (21)	4.38±0.22 (21)	0.244[a]	Baseline	0.913±0.12 (21)	0.900±0.14 (21)	0.687[a]
Week 12	4.05±0.17 (10)	4.19±0.17 (10)	0.086[a]	Week 12	0.950±0.16 (10)	0.870±0.16 (10)	0.253[a]
Change from Baseline to Week 12	-0.26±0.13 (10)	-0.26±0.16 (10)	0.294[c]	Change from Baseline to Week 12	0.021±0.05 (10)	0.000±0.03 (10)	0.372[c]
AST (U/L)				**Uric acid (mg/dL)**			
Baseline	19.6±4.82 (21)	21.8±4.28 (21)	0.073[b]	Baseline	6.00±1.26 (21)	5.36±1.01 (21)	0.078[a]
Week 12	20.1±4.48 (10)	23.8±6.30 (10)	0.148[a]	Week 12	6.14±1.09 (10)	5.56±1.24 (10)	0.282[a]
Change from Baseline to Week 12	0.40±2.88 (10)	1.40±4.72 (10)	0.448[c]	Change from Baseline to Week 12	0.11±0.68 (10)	0.06±0.56 (10)	0.744[c]
ALT (U/L)				**Na (mEq/L)**			
Baseline	18.0±7.73 (21)	21.7±8.61 (21)	0.073[b]	Baseline	140.3±1.15 (21)	139.8±1.44 (21)	0.268[b]
Week 12	19.1±7.41 (10)	23.6±7.60 (10)	0.197[a]	Week 12	140.1±1.37 (10)	139.9±1.37 (10)	0.748[a]
Change from Baseline to Week12	0.4±6.22 (10)	1.8±5.73 (10)	0.456[c]	Change from Baseline to Week 12	0.1±0.88 (10)	-0.4±1.26 (10)	0.387[c]
γGTP (U/L)				**K (mEq/L)**			
Baseline	32.4±17.2 (21)	31.4±16.7 (21)	0.840[b]	Baseline	4.28±0.30 (21)	4.22±0.27 (21)	0.484[a]
Week 12	36.5±32.0 (10)	36.7±13.0 (10)	0.344[b]	Week 12	4.34±0.18 (10)	4.31±0.37 (10)	0.821[a]
Change from Baseline to Week 12	5.5±29.9 (10)	-0.4±6.78 (10)	0.685[c]	Change from Baseline to Week 12	0.08±0.24 (10)	0.15±0.31 (10)	0.822[c]

a. Inter-group comparisons were made using an unpaired t-test.
b. Inter-group comparisons were made using Mann–Whitney *U* test.
c. Inter-group comparisons were made using ANCOVA for adjusting the baseline

Supplementary Table 4.
NMN supplementation does not affect metabolic parameters. Related to Figure 3.

	Placebo Mean ± SD (n)	NMN Mean ± SD (n)	Between group p-value		Placebo Mean ± SD (n)	NMN Mean ± SD (n)	Between group p-value
Triglycerides (mg/dL)				**HDL Cholesterol (mg/dL)**			
Baseline	114.6 ± 49.5 (21)	116.5 ± 42.4 (21)	0.897[a]	Baseline	62.8 ± 14.1 (21)	61.6 ± 17.4 (21)	0.803[a]
Week 12	82.4 ± 36.8 (10)	107.6 ± 37.0 (10)	0.045[b*]	Week 12	58.7 ± 15.2 (10)	62.1 ± 16.4 (10)	0.635[a]
Change from Baseline to Week 12	-19.8 ± 26.3 (10)	-9.1 ± 14.2 (10)	0.133[c]	Change from Baseline to Week 12	-2.5 ± 4.2 (10)	-5.2 ± 3.9 (10)	0.233[c]
LDL Cholesterol (mg/dL)				**Interleukin-6 (pg/mL)**			
Baseline	134.4 ± 26.5 (21)	125.7 ± 36.8 (21)	0.386[a]	Baseline	1.66 ± 0.62 (21)	1.29 ± 0.75 (21)	0.031[b*]
Week 12	121.8 ± 17.0 (10)	109.0 ± 36.8 (10)	0.331[a]	Week 12	1.50 ± 0.62 (10)	1.39 ± 0.81 (10)	0.403[b]
Change from Baseline to Week 12	-10.4 ± 14.5 (10)	-16.4 ± 10.3 (10)	0.311[c]	Change from Baseline to Week 12	-0.28 ± 0.94 (10)	0.49 ± 0.67 (10)	0.762[c]
Adiponectin (μg/mL)							
Baseline	8.59 ± 2.70 (21)	8.95 ± 4.91 (21)	0.460[b]				
Week 12	8.76 ± 2.93 (10)	8.35 ± 3.50 (10)	0.780[a]				
Change from Baseline to Week 12	-0.21 ± 0.87 (10)	0.03 ± 1.15 (10)	0.669[c]				

a. Inter-group comparisons were made using an unpaired t-test.
b. Inter-group comparisons were made using Mann–Whitney *U* test.
c. Inter-group comparisons were made using ANCOVA for adjusting the baseline
*P<0.05

Supplementary Table 5.
The effect of NMN on auditory and cognitive functions

	Placebo Mean±SD (n)	NMN Mean±SD (n)	Between group p-value		Placebo Mean±SD (n)	NMN Mean±SD (n)	Between group p-value
Hearing Testing (Right/dB) p= 0.0268[b]*				**Hearing Testing (Left/dB) p=0.636[b]**			
Baseline	23.8±12.2 (21)	27.2±14.0 (21)	0.512[d]	Baseline	21.6±8.60 (21)	30.9±16.6 (21)	0.072[d].
Week 6	24.6±13.0 (21)	27.6±14.3 (21)	0.504[d]	Week 6	21.9± 9.07 (21)	31.5±16.6 (21)	0.051[d].
Week 12	20.3±10.2 (10)	25.8±9.6 (10)	0.229[c]	Week 12	19.3±9.00 (10)	31.0±13.5 (10)	0.019[d]*
Change from Baseline to Week 6	0.8±2.7 (21)	0.4±3.1 (21)	0.610[e]	Change from Baseline to Week 6	0.30±3.76 (21)	0.66±3.91 (21)	0.617[e]
Change from Baseline to Week 12	2.1±2.7 (10)	-0.1±2.2 (10)	0.117[e]	Change from Baseline to Week 12	1.14± 2.40 (10)	0.63±3.02 (10)	0.766[e]
MMSE-J(score)				**MOCA-J(score)**			
Baseline	28.4±1.72 (21)	28.1±2.23 (21)	0.768[d]	Baseline	24.9±2.49 (21)	24.9±2.43 (21)	1.000[c]
Week 12	28.9±1.10 (10)	27.8±1.81 (10)	0.130[d]	Week 12	26.0±2.00 (10)	26.7±1.83 (10)	0.425[c]
Change from Baseline to Week 12	1.0±1.33 (10)	-0.5±2.07 (10)	0.100[e].	Change from Baseline to Week 12	0.3±2.11 (10)	1.0±2.36 (10)	0.403[e]

a. Treatment was compared using a mixed model analysis. The p-value denotes interaction.
b. Treatment was compared using MMRM. p-value denotes interaction.
c. Inter-group comparisons were made using an unpaired t-test (no adjustment for baseline).
d. Inter-group comparisons were made using the Mann–Whitney *U* test (no adjustment for baseline).
e. Inter-group comparisons were made using ANCOVA for adjusting the baseline.
*P<0.05

Supplementary Table 6. The effect of NMN on BMI and vascular function

	Placebo Mean±SD (n)	NMN Mean±SD (n)	Between group p-value		Placebo Mean±SD (n)	NMN Mean±SD (n)	Between group p-value
BMI (kg/m2) p=0.341[a], p=0.851[b]				**Systolic Blood Pressure (mmHg) p=0.969[a], p=0.431[b]**			
Baseline	24.5±1.36 (21)	24.1±1.44 (21)	0.283[d]	Baseline	130.6±19.6 (21)	129.5±15.3 (21)	0.950[d]
Week 6	24.4±1.32 (21)	24.0±1.44 (21)	0.283[d]	Week 6	126.1±19.4 (21)	129.2±16.1 (21)	0.577[c]
Week 12	24.6±1.24 (10)	23.5±1.23 (10)	0.670[c]	Week 12	128.8±20.5 (10)	131.7±25.1 (10)	0.781[c]
Change from Baseline to Week 6	-0.06±0.34 (21)	-0.08±0.24 (21)	0.752[e]	Change from Baseline to Week 6	-4.4±11.9 (21)	-0.2±7.8 (21)	0.194[e]
Change from Baseline to Week 12	-0.26±0.37 (10)	-0.25±0.45 (10)	0.830[e]	Change from Baseline to Week 12	1.8±13.0 (10)	-4.2±13.0 (10)	0.333[e]
Flow Mediated Dilation (%) p=0.420[b]				**Diastolic blood pressure(mmHg) p=0.153[b]**			
Baseline	4.00±1.56 (21)	4.09±1.52 (21)	0.85[c]	Baseline	79.9±9.4 (21)	81.3±11.8 (21)	0.632[d]
Week 6	3.80±1.93 (21)	3.84±1.79 (21)	0.941[c]	Week 6	81.4±12.2 (21)	82.6±11.2 (21)	0.744[c]
Week 12	3.77±1.38 (10)	3.85±1.35 (10)	0.897[c]	Week 12	81.2±8.9 (10)	81.7±11.0 (10)	0.912[c]
Change from Baseline to Week 6	-0.20±1.46 (21)	-0.24±2.25 (21)	0.936[c]	Change from Baseline to Week 6	1.5±7.3 (21)	1.3±4.6 (21)	0.955[e]
Change from Baseline to Week 12	-0.20±2.10 (10)	-0.25±1.72 (10)	0.925[e]	Change from Baseline to Week 12	0.0±6.6 (10)	-3.5±8.1 (10)	0.464[e]

a. Treatment was compared using a mixed model analysis. The p-value denotes interaction.
b. Treatment was compared using MMRM. p-value denotes interaction.
c. Inter-group comparisons were made using an unpaired t-test (no adjustment for baseline).
d. Inter-group comparisons were made using the Mann–Whitney *U* test (no adjustment for baseline).
e. Inter-group comparisons were made using ANCOVA for adjusting the baseline.