**Table S1.** Differences in plasma-metabolite concentrations and abundances of genes encoding key enzymes (*grdH, cntA, cutC*) of main TMA-forming pathways in stool samples of subjects by age groups. Significance (p.age) was assessed based on continuous age data.

| Metabolite | 18-25 (N=16) | 26-35 (N=57) | 36-55 (N=157) | 56-65 (N=94) | 66+ (N=101) | p.age |
|------------|--------------|--------------|---------------|--------------|-------------|-------|
| **TMAO (µM)** | | | | | | <0.01 |
| Mean (SD) | 2.23 (1.74) | 2.53 (2.71) | 3.18 (6.54) | 3.69 (6.29) | 3.60 (3.36) | |
| Median [Min, Max] | 1.80 [0.799, 6.94] | 1.84 [0.666, 20.1] | 1.85 [0.479, 74.6] | 2.21 [0.373, 57.4] | 2.53 [0.466, 25.3] | |
| **Choline (µM)** | | | | | | 0.980 |
| Mean (SD) | 4.81 (1.16) | 8.34 (3.49) | 7.95 (3.51) | 8.60 (3.67) | 8.87 (4.28) | |
| Median [Min, Max] | 4.46 [3.16, 7.08] | 7.81 [3.54, 23.8] | 7.23 [0.442, 27.7] | 7.76 [0.518, 18.0] | 8.03 [0.288, 22.8] | |
| **Betaine (µM)** | | | | | | <0.01 |
| Mean (SD) | 13.8 (9.63) | 21.7 (20.3) | 18.4 (12.9) | 19.8 (9.94) | 22.1 (14.2) | |
| Median [Min, Max] | 11.6 [4.13, 38.5] | 15.6 [4.73, 120] | 14.8 [3.32, 75.6] | 18.1 [5.31, 47.4] | 19.1 [1.48, 84.3] | |
| **Carnitine (µM)** | | | | | | 0.022 |
| Mean (SD) | 37.0 (25.1) | 44.6 (22.2) | 46.7 (21.8) | 47.6 (20.0) | 47.5 (19.7) | |
| Median [Min, Max] | 32.4 [4.99, 112] | 36.7 [15.1, 120] | 44.0 [9.98, 125] | 43.9 [16.5, 124] | 46.5 [6.46, 101] | |
| **cutC (x10^5)** | | | | | | <0.01 |
| Mean (SD) | 1.22 (1.37) | 1.09 (1.17) | 1.31 (1.35) | 1.67 (2.02) | 1.61 (1.28) | |
| Median [Min, Max] | 0.88 [0.05, 5.94] | 0.74 [0.04, 7.22] | 1.04 [0.04, 11.4] | 1.21 [0.06, 15.5] | 1.38 [0.09, 7.41] | |
| **cntA (x10^5)** | | | | | | <0.01 |
| Mean (SD) | 0.626 (1.59) | 0.157 (0.409) | 1.24 (4.99) | 3.23 (15.9) | 1.59 (3.91) | |
| Median [Min, Max] | 0.04 [0.03, 6.44] | 0.03 [0.03, 2.68] | 0.03 [0.03, 47.5] | 0.03 [0.03, 134] | 0.13 [0.03, 23.4] | |
| **grdH (x10^5)** | | | | | | 0.602 |
| Mean (SD) | 0.108 (0.096) | 0.181 (0.315) | 0.179 (0.355) | 0.172 (0.279) | 0.137 (0.203) | |
| Median [Min, Max] | 0.07 [0.02, 0.32] | 0.08 [0.01, 2.07] | 0.07 [0.01, 3.24] | 0.09 [0.01, 1.77] | 0.07 [0.01, 1.17] | |