Table 1. Overall macromolecular composition of an average *E. coli* cell in aerobic balanced growth at 37°C in glucose minimal medium, with doubling time of 40 minutes and 1 pg cell wet weight (≈0.9 μm3 cell volume). Adapted with modifications from F. C. Neidhardt et al., “Physiology of the bacterial cell”, Sinauer, 1990 (BNID 104954). Modifications included increasing cell dry weight from 284 fg to 300 fg and total cell mass from 950 to 1000 fg as well as rounding other values to decrease the number of significant digits such that values reflect expected uncertainties ranges. Under different growth rates the volume and mass per cell can change several fold. The relative composition changes with growth rate but not as significantly. For a given cell volume and growth rate, the uncertainty in most properties is expected to be on the order of 10-30% standard deviation. Original values refer to B/r strain, but to within the uncertainty expected, the values reported here are considered characteristic of most common *E. coli* strains. An independent source for slower growth rates can be found at BNID 111460.



Notes:

The cell wet mass density is about 1.1 so 1 pg of cell wet mass corresponds to a cell volume of about 0.9 um3.

Note that mRNAs are polycistronic, and their mass corresponds to 2-3 kbp.

The number of DNA molecules refers to double stranded genomes copies. Note that due to nested DNA replication, cells dividing at 40 minutes doubling time have between 1.5 and 3 copies of their double stranded DNA.

Based on the cell composition in the table the number of carbon atoms should be 8x109. We chose to round to the closer order of magnitude to covey the variability in cell mass and composition as well as to be consistent with the ATP and sugar demand given below which are less accurately known.

Nitrogen source for growth is ammonium. On other nitrogen sources growth rates can be much slower.

Growth rate of strain K12/MG1655 on M9 media with glucose is usually around 45-50 min doubling time. A value of 40 min was used here for consistency with original table. The original 40 min value has the elegant property that it is equal to the C period suggested for DNA replication thus making the calculation of DNA copy number solvable analytically giving a value of 2.125 (D assumed to be 20 min).