

Table 1. *Some quantitative aspects of 'model' freshwater micro-algal cells*

	Cell of 5 μm radius	Cell of 10 μm radius
Cell surface area (m^2)	314×10^{-12}	1257×10^{-12}
Cell volume (m^3)	524×10^{-18}	4189×10^{-18}
Cell wet wt (g)	524×10^{-12}	4189×10^{-12}
Cell organic wt (g)	131×10^{-12}	1047×10^{-12}
Cell C content (g)	65×10^{-12}	524×10^{-12}
Cell C content (mol)	5.45×10^{-12}	43.6×10^{-12}
Cell N content (mol)	0.78×10^{-12}	6.23×10^{-12}
Specific growth rate ($\log_e 2$ /generation time) (s^{-1}) assuming specific growth rate \propto (cell C content) $^{-0.33}$ [equation (1)]	8×10^{-6}	4×10^{-6}
Specific growth rate ($\log_e 2$ /generation time) (s^{-1}), assuming specific growth rate \propto (cell C content) $^{-0.25}$ [equation (2)]	8×10^{-6}	4.75×10^{-6}
Specific maintenance rate (s^{-1}) assuming specific maintenance rate \propto (cell C content) $^{-0.33}$ [equation (1)]	3×10^{-8}	1.5×10^{-8}
Specific maintenance rate (s^{-1}) assuming specific maintenance rate \propto (cell C content) $^{-0.25}$ [equation (1)]	3×10^{-8}	1.77×10^{-8}
Minimum mechanistic power consumption for growth (W) [equation (1)]	39.1×10^{-12}	156×10^{-12}
Minimum mechanistic power consumption of growth (W) [equation (2)]	39.1×10^{-12}	186×10^{-12}
Minimum mechanistic power output for maintenance (W) [equation (1)]	5.4×10^{-14}	21.6×10^{-14}
Minimum mechanistic power output for maintenance (W) [equation (2)]	5.4×10^{-14}	25.5×10^{-14}
Minimum mechanistic power required for flagellar motion at frequency of 100 s^{-1} (W)	2.2×10^{-13}	2.2×10^{-13}
Minimum mechanistic power required for flagellar motion at frequency of 10 s^{-1} (W)	2.2×10^{-14}	2.2×10^{-14}
Minimum thermodynamic power required for swimming at $50 \mu\text{m s}^{-1}$ (W)	2.38×10^{-16}	4.7×10^{-16}