

Table 1. Factors used to calculate energy gained from phototrophy for PRP bacteria and AAP bacteria in a coastal ocean

Factor	Units	PRP bacteria	AAP bacteria	Cyanobacteria	Comments
Photosynthetic units	per cell	10 000	1700	50 000	Tables 2 and 3
Cross-section area	10^{-20} m ²	2	50	100	Table 4
Quantum efficiency	Unitless	0.6	NA	0.25	See main text
Protons pumped	per photon	1	2	3	See main text
Energy per photon	kJ mol ⁻¹	23	46	69	See main text
Maximum rate	e ⁻ or H ⁺ RC ⁻¹ s ⁻¹	22	87	140	See main text
Half-saturation	μmol photons m ⁻² s ⁻¹	2700	191	40	See main text
PAR	μmol photons m ⁻² s ⁻¹	500	500	500	For example
Energetic benefit	kJ cell ⁻¹ day ⁻¹	6×10^{-14}	8×10^{-13}	1.9×10^{-11}	Linear
Energetic benefit	kJ cell ⁻¹ day ⁻¹	6×10^{-14}	4×10^{-13}	3×10^{-11}	Hyperbolic

Analogous data for the cyanobacterium *Synechococcus elongatus* are also given (MacKenzie *et al.*, 2004). The quantum efficiency is not applicable (NA) in the calculation for AAP bacteria because it is effectively included in the measurement of the absorption cross-section area. The maximum rate refers to the maximum flux of electrons or protons pumped per reaction centre (RC) for AAP or PRP bacteria respectively. The gross energetic benefit (costs are not included here) was calculated by assuming either a linear or a hyperbolic response to light intensity.

