

Table S5. Summary of heterotrophic protist species analyzed in this study. Volume: cell volume ( $\mu\text{m}^3$ ).  
 $T_{\text{opt}}$ : optimal growth temperature ( $^{\circ}\text{C}$ ).  $E_{\text{intra}}$ : Intraspecific activation energy estimated by fixed-effect (OLS) model.

Group	Species	Habitat	Volume	$T_{\text{opt}}$	$E_{\text{intra}}$
Ciliates	Favella sp.	Marine	593405	18.8	0.69
Ciliates	Aspidisca angulata	Marine	3961	20	0.89
Amoebae	Arcella vulgaris	Freshwater	185580	20	0.19
Ciliates	Euplotes vannus	Marine	59000	26	0.98
Ciliates	Euplotes balteatus	Marine	15000	28	0.91
Ciliates	Euplotes crassus	Marine	159882	29	0.39
Ciliates	Strombidiu m sulcatum	Marine	19388	31	0.59
Ciliates	Euplotes harpa	Marine	578615	30	0.39
Ciliates	Paratetrahy mena wassi	Marine	25525	34	0.97
Ciliates	Condylostoma arenarium	Marine	1703397	29	0.58
Ciliates	Euplotes trisulcatus	Marine	37322	33	0.84
Ciliates	Pseudobalanion planctonicum	Freshwater	1312.4	18.5	0.60
Ciliates	Urotricha furcata	Freshwater	2750	21.5	0.60
Amoebae	Amoeba algonquinensis	Freshwater	253291	12	0.93
Ciliates	Pelagostrombidium fallax	Freshwater	36200	21.5	1.36
Ciliates	Strobilidium lacustris	Freshwater	71800	21.5	0.56
Flagellates	Monas sp.	Freshwater	30	23.5	0.53
Ciliates	Euplotes vannus	Marine	59000	30	0.56
Ciliates	Euplotes vannus	Marine	59000	20	0.92

Ciliates	Euplotes vannus	Marine	59000	20	1.38
Ciliates	Euplotes vannus	Marine	59000	25	0.47
Ciliates	Urotricha furcata	Freshwater	1543.33333	20	1.00
Ciliates	Urotricha furcata	Freshwater	944.55	25	0.41
Ciliates	Urotricha furcata	Freshwater	1500.4	25	0.74
Ciliates	Urotricha farcta	Freshwater	2328.6	25	1.23
Ciliates	Urotricha farcta	Freshwater	1402.75	25	0.48
Ciliates	Urotricha farcta	Freshwater	3350	18	0.48
Ciliates	Urotricha castalia	Freshwater	9750	12.5	2.53
Ciliates	Urotricha furcata	Freshwater	3150	20	1.16
Ciliates	Urotricha furcata	Freshwater	3150	25	0.36
Ciliates	Balanion planctonicum	Freshwater	1700	18	0.89
Ciliates	Balanion planctonicum	Freshwater	2330	18.5	0.57
Ciliates	Urotricha farcta	Freshwater	3350	21	0.86
Flagellates	Paraphysomonas imperforata	Marine	1.44	14.9	1.00
Ciliates	Strombidinopsis multiauris	Marine	176060.756	19	0.83
Ciliates	Balanion sp.	Marine	18230	20	0.40
Amoebae	Saccamoeba limax	Freshwater	2940	12	1.20
Dinoflagellates	Oxyrrhis marina	Marine	5888.33333	25	1.16

	Condylostoma				
Ciliates	spatiosum	Marine	1946760	24	0.89
	Paranophrys				
Ciliates	magna	Marine	21271	30	0.61
	Miamiensis				
Ciliates	avidus	Marine	778	25	0.54
Amoebae	Vannella sp.	Freshwater	10123	12	1.86
	Paramecium				
Ciliates	caudatum	Freshwater	318581	28	0.75
	Acanthamoeba				
Amoebae	polyphaga	Freshwater	1226.66667	20	0.85
	Paramecium				
Ciliates	caudatum	Freshwater	318581	28	0.80
	Cochliopodium				
Amoebae	minus	Freshwater	3247.5	25	0.75
Dinoflagellates	Gyrodinium				
	dominans	Marine	2489.66667	18	0.92
	Meseres				
Ciliates	corlissi	Freshwater	48483.3333	25	2.30
	Paramecium				
Ciliates	caudatum	Freshwater	318581	28	0.62
	Paramecium				
Ciliates	caudatum	Freshwater	318581	28	0.70
	Paramecium				
Ciliates	caudatum	Freshwater	318581	28	0.79
	Paramecium				
Ciliates	caudatum	Freshwater	318581	28	0.73
	Paramecium				
Ciliates	caudatum	Freshwater	318581	28	0.67
	Paramecium				
Ciliates	caudatum	Freshwater	318581	28	0.69

	Paramecium				
Ciliates	caudatum	Freshwater	318581	28	0.82
	Paramecium				
Ciliates	caudatum	Freshwater	318581	28	0.92
	Glaseria				
Amoebae	mira	Freshwater	416.5	25	0.52
	Paramecium				
Ciliates	aurelia	Freshwater	253998	33	0.98
	Paramecium				
Ciliates	bursaria	Freshwater	272101	30	0.36
	Coleps				
Ciliates	hirtus	Freshwater	22957.8	25	0.59
	Tetrahymena				
Ciliates	piriformis	Freshwater	13184.7778	24	1.62
	Tetrahymena				
Ciliates	thermophila	Freshwater	18248.9	38	0.82
	Saccamoeba				
Amoebae	limax	Freshwater	5973.33333	20	0.71
	Paramecium				
Ciliates	caudatum	Freshwater	318581	31	1.58
	Paramecium				
Ciliates	caudatum	Freshwater	318581	28	1.02
	Paramecium				
Ciliates	caudatum	Freshwater	318581	31	0.73
	Paramecium				
Ciliates	caudatum	Freshwater	318581	28	0.77
Amoebae	Vanella sp.	Freshwater	7902.5	25	0.60
	Clydonella				
Amoebae	rosenfieldi	Marine	465.5	20	0.85
	Paraflabellula				
Amoebae	reniformis	Marine	450.75	20	0.60
	Paramecium				
Ciliates	caudatum	Freshwater	318581	28	0.72

Dinoflagellates	Noctiluca scintillans	Marine	1.20E+07	23	0.76
Amoebae	Platyamoeba sp.	Marine	35.25	20	0.46
Dinoflagellates	Oxyrrhis marina	Marine	5598.57143	22	1.22
Amoebae	Platyamoeba sp.	Marine	179.5	20	0.64
Dinoflagellates	Protoperidinium bipes	Marine	796	15	1.70
Ciliates	Paramecium caudatum	Freshwater	318581	28	0.82
Amoebae	Stereomyxa ramosa	Marine	658	15	0.60
Amoebae	Vahlkampfi	Marine	377.75	20	0.78
Amoebae	Vahlkampfi	Marine	377.75	20	0.78
Amoebae	ae damariscottae	Marine	87.5	20	0.68
Ciliates	Paramecium caudatum	Freshwater	318581	28	0.70
Ciliates	Paramecium caudatum	Freshwater	318581	28	0.59
Amoebae	Vannella caledonica	Marine	402	20	0.20
Amoebae	Vannella sp.	Marine	40.5	20	0.62
Flagellates	Paraphysomonas imperforata	Marine	232	26	0.65
Ciliates	Pelagostrombidium planc	Freshwater	NA	18.5	0.61
Flagellates	Paraphysomonas imperforata	Marine	20	15	0.83
Ciliates	Uronema marina	Marine	461	20	1.25