Table S2. Dimensions and shape ratios of the bony labyrinths of cetaceans. Data from the bony labyrinths of Balaenopteridae (NC) (from Pliocene of North Carolina) and *Tursiops truncatus* were taken from Ekdale (2013). Daggers (†) indicate extinct taxa. Abbreviations: #T – number of turns completed by cochlea; %C – volumetric contribution (%) of cochlea to entire bony labyrinth, calculated as Cv/(Cv+Vv); 2L/C – extension (%) of secondary bony lamina within cochlear canal, calculated as 2Ll/Cl; 2Ll – spiral length of secondary bony lamina (mm); Ap – axial pitch of cochlea, calculated as Ch/#T (mm); BLl – total length of bony labyrinth (mm); Br – basal (aspect) ratio of cochlear spiral, calculated as Ch/Cw; Ch – height of cochlear spiral (mm); Cl – spiral length of cochlear canal (mm); Cra – radius of apical turn of cochlea (mm); Crb – radius of basal turn of cochlea (mm); Cs – cochlear slope, calculated as Ch/Cl/#T; CT – product of length of cochlear canal and number of turns, calculated as Cl x #T; Cv – volume of cochlear canal (mm^3); Cw – width of basal turn of cochlea (mm); LF – estimated low frequency limit (Hz) based on graded curvature (following Manoussaki et al., 2008); Vv – volume of vestibular system including ampullae and semicircular canals (mm^3); ρ – graded curvature of cochlea, calculated as Crb/Cra).

Taxon	BLl	Cv	Vv	%Cv	#T	2Ll	Cl	Ch	Cw	2L/C	CT	Br	Ap	Cs	Crb	Cra	ρ	LF
Basilosauridae																		
Zygorhiza kochii†	11.4	274	54	84%	2.5	16.6	33.7	6.5	12.4	49%	84.3	0.5	2.6	0.08	6.0	0.6	10.0	8
Mysticeti																		
Balaena mysticetus	20.5	618	184	77%	2.0	16.6	54.7	8.5	16.8	30%	109.4	0.5	4.3	0.08	9.0	1.6	5.6	107

Balaenoptera acutorostrata	16.7	549	116	83%	2.5	31.6	52.9	9.9	15.1	60%	132.3	0.7	4.0	0.07	8.0	1.1	7.6	34
Balaenopteridae†	19.0	535	106	83%	2.0	30.1	51.1	8.1	17.1	59%	102.2	0.5	4.1	0.08	7.8	0.9	8.7	18
Balaenopteridae (NC)†	19.7	974	102	91%	2.4	32.5	66.9	12.1	25.0	49%	160.6	0.5	5.0	0.08	10.5	1.2	8.7	18
Eschrichtius robustus (neonate)	20.1	721	158	82%	2.2	31.2	59.6	11.0	21.1	52%	131.1	0.5	5.0	0.08	9.0	1.3	6.9	49
Eschrichtius robustus (adult)	20.7	783	189	81%	2.1	36.1	60.9	9.5	19.1	59%	127.9	0.5	4.5	0.07	8.9	1.3	6.8	51
Eschrichtiidae†	18.5	469	93	83%	2.4	28.4	57.8	10.6	16.5	49%	138.7	0.6	4.4	0.08	7.9	1.2	6.6	60
Eubalaena glacialis	21.6	559	126	82%	2.4	8.3	57.2	9.1	15.4	15%	137.3	0.6	3.8	0.07	8.3	0.9	9.6	10
"Megaptera" miocaena†	17.4	424	111	79%	2.7	18.2	57.9	9.6	14.7	31%	156.3	0.7	3.6	0.06	7.6	1.0	7.6	33
Megaptera novaeangliae	20.0	936	175	84%	2.2	35.3	57.6	9.2	18.0	61%	126.7	0.5	4.2	0.07	9.5	1.3	7.3	39
Odontoceti																		
Tursiops truncatus	10.1	146	20	88%	1.7	30.6	35.0	6.2	13.3	87%	59.5	0.5	3.6	0.10	5.5	1.2	4.6	187