

Supplementary Table 1. Cellular brain scaling rules calculated from average species values in the original rodent dataset.

Dependent variable	Independent variable	Power law	p-value, exponent	95% confidence interval
M_{BR}	N_{BR}	$M_{BR} = 3.459 \times 10^{-13} \times N_{BR}^{1.550}$	0.0001	1.254-1.846
M_{CX}	N_{CX}	$M_{CX} = 7.445 \times 10^{-14} \times N_{CX}^{1.748}$	<0.0001	1.504-1.992
M_{CB}	N_{CB}	$M_{CB} = 6.507 \times 10^{-12} \times N_{CB}^{1.314}$	<0.0001	1.060-1.568
M_{ROB}	N_{ROB}	$M_{ROB} = 1.471 \times 10^{-12} \times N_{ROB}^{1.627}$	0.0079	0.711-2.543
M_{BR}	O_{BR}	$M_{BR} = 1.025 \times 10^{-9} \times O_{BR}^{1.142}$	<0.0001	1.121-1.163
M_{CX}	O_{CX}	$M_{CX} = 1.194 \times 10^{-9} \times O_{CX}^{1.144}$	<0.0001	1.012-1.276
M_{CB}	O_{CB}	$M_{CB} = 8.225 \times 10^{-9} \times O_{CB}^{1.025}$	0.0005	0.748-1.302
M_{ROB}	O_{ROB}	$M_{ROB} = 1.506 \times 10^{-9} \times O_{ROB}^{1.130}$	<0.0001	0.980-1.280
M_{CX}	M_{BR}	$M_{CX} = 0.454 \times M_{BR}^{1.070}$	<0.0001	1.026-1.114
M_{CB}	M_{BR}	$M_{CB} = 0.150 \times M_{BR}^{0.927}$	<0.0001	0.810-1.043
M_{ROB}	M_{BR}	$M_{ROB} = 0.396 \times M_{BR}^{0.917}$	<0.0001	0.878-0.957

Power laws were calculated from the average species values listed in Table 1, originally from Herculano-Houzel et al., 2006. Species included are mouse, hamster, rat, guinea pig, agouti and capybara. RoB and whole brain do not include olfactory bulb.

Supplementary Table 2. Cellular scaling functions for the previous and expanded glires dataset

		Previous dataset		Expanded dataset	
		uncorrected	independent contrasts	Uncorrected	independent contrasts
$M_{CX} \times N_{CX}$	slope	1.748	1.679	1.699	1.627
	p-value	<0.0001	<0.0001	<0.0001	<0.0001
$M_{CB} \times N_{CB}$	slope	1.314	1.292	1.305	1.300
	p-value	<0.0001	<0.0001	<0.0001	<0.0001
$M_{RoB} \times N_{RoB}$	slope	1.627	1.583	1.568	1.559
	p-value	0.0079	0.0124	<0.0001	0.0003
$M_{BR} \times N_{BR}$	slope	1.550	1.519	1.499	1.519
	p-value	<0.0001	0.0002	<0.0001	<0.0001
$M_{CX} \times O_{CX}$	slope	1.144	1.126	1.132	1.133
	p-value	<0.0001	<0.0001	<0.0001	<0.0001
$M_{CB} \times O_{CB}$	slope	1.025	0.964	1.002	0.958
	p-value	0.0005	0.0007	<0.0001	<0.0001
$M_{RoB} \times O_{RoB}$	slope	1.130	1.194	1.073	1.180
	p-value	<0.0001	<0.0001	<0.0001	<0.0001
$M_{BR} \times O_{BR}$	slope	1.142	1.141	1.114	1.140
	p-value	<0.0001	<0.0001	<0.0001	<0.0001

$M_{BR} \times M_{BD}$	slope	0.761	0.639	0.712	0.616
	p-value	0.0006	0.0002	<0.0001	<0.0001

All slopes are calculated from average data for each species and exclude the olfactory bulb. Previous dataset is that of Herculano-Houzel et al. (2006), from which olfactory bulbs were excluded according to Table 1, and values then averaged per species. The extended dataset does not include naked mole-rat. All exponents are from least-squares regressions.

Supplementary Table 3. Updated cellular brain scaling rules calculated from average species values in the original rodent dataset.

Dependent variable	Independent variable	Power law	p-value, exponent	95% confidence interval
N_{BR}	M_{BR}	$N_{BR} = 111,204,990.874 \times M_{BR}^{0.633}$	0.0001	0.512-0.754
N_{CX}	M_{CX}	$N_{CX} = 32,507,471.825 \times M_{CX}^{0.566}$	<0.0001	0.487-0.646
N_{CB}	M_{CB}	$N_{CB} = 322,691,805.819 \times M_{CB}^{0.747}$	<0.0001	0.602-0.891
N_{ROB}	M_{ROB}	$N_{ROB} = 19,266,240.173 \times M_{ROB}^{0.528}$	0.0079	0.231-0.825
O_{BR}	M_{BR}	$O_{BR} = 74,557,479.205 \times M_{BR}^{0.876}$	<0.0001	0.859-0.892
O_{CX}	M_{CX}	$O_{CX} = 63,449,109.729 \times M_{CX}^{0.868}$	<0.0001	0.768-0.968
O_{CB}	M_{CB}	$O_{CB} = 75,879,347.322 \times M_{CB}^{0.940}$	0.0005	0.686-1.195
O_{ROB}	M_{ROB}	$O_{ROB} = 63,902,655.885 \times M_{ROB}^{0.855}$	<0.0001	0.760-0.993
M_{CX}	M_{BR}	$M_{CX} = 0.454 \times M_{BR}^{1.070}$	<0.0001	1.026-1.114
M_{CB}	M_{BR}	$M_{CB} = 0.150 \times M_{BR}^{0.927}$	<0.0001	0.810-1.043
M_{ROB}	M_{BR}	$M_{ROB} = 0.396 \times M_{BR}^{0.917}$	<0.0001	0.878-0.957
DN_{CX}	M_{CX}	$DN_{CX} = 32,959.394 \times M_{CX}^{-0.431}$	<0.0001	-0.508- -0.354
DN_{CB}	M_{CB}	$DN_{CB} = 308,922.621 \times M_{CB}^{-0.276}$	0.0021	-0.382- -0.166
DN_{ROB}	M_{ROB}	$DN_{ROB} = 18,171.077 \times M_{ROB}^{-0.440}$	0.0091	-0.699- -0.182

Power laws were calculated from the average species values listed in Table 1, originally from Herculano-Houzel et al., 2006. Species included are mouse, hamster, rat, guinea pig, agouti and capybara. RoB and whole brain do not include olfactory bulb.