

## Supplementary material: literature analysis.

For rat studies, we used the scaling rules for rodent cortex from physical fractionator work (Herculano-Houzel et al., 2006) to convert counts to mouse (Table S1). Specifically, the following multipliers were used to convert rat data to mouse: 0.34 for pooled neurons and glia; 0.41 for neurons; and 0.29 for glia.

Table S1: Rat to Mouse Scaling (Herculano-Houzel et al., 2006: Cellular scaling rules for rodent brains).

Species	Total cells ( $\times 10^6$ )	% Total cell in cortex	Total neurons ( $\times 10^6$ )	% Total neurons in cortex	Total cells in cortex	Total neurons in cortex
Mouse	108.69 $\pm$ 16.25	24	70.89 $\pm$ 10.41	20	26 $\times 10^6$	14 $\times 10^6$
Rat	331.65 $\pm$ 8.84	23	200.13 $\pm$ 12.17	17	76 $\times 10^6$	34 $\times 10^6$

Table S2: Additional assumptions used to deduce or interpret cell counts values from the literature.

#	Assumptions
1	We consider the number of glial cells in the principal layers of CA1, CA2, CA3 and DG as negligible compared to the number of neurons in the same parcels.
2	We used the combined data from CA2 and CA3 for our comparisons since not enough data exist on these two regions separately for a robust comparison with our numbers.
3	We consider Herculano-Houzel's neuron and non-neuron numbers as corresponding to the reported distribution averages of 400,019 $\pm$ 36,262 and 574,736 $\pm$ 33,256, respectively.

Table S3: Multiple source derivation of the average counts used in Table 1 of main text for a. DG; b. CA2/3; c. CA1; d. subiculum; and e. entorhinal cortex.

a. Dentate Gyrus (Excluding granule cell layer)										
Neurons							Glia			
DGmo			DGpo				Glia			
			Source	Species	Original	Scaled to mouse	Source	Species	Cell Type	Original
Source	Kim et al., 2017	Ero et al., 2018	Grady et al., 2003	Rat	65,420	26,822	Long et al., 1998	Mouse	Microglia	22,000 (DGmo + DG-Granule)
							Ero et al.,	Mouse	Microglia	84,459/2 = 42,230

							2018							
							Long et al., 1998	Mouse	Astrocytes		70,000 (DGmo + DG-Granule)			
							Ero et al., 2018	Mouse	Astrocytes		$55,756/2 = 27,878$			
Species	Mouse	Mouse	Fitting et al., 2009	Rat	52,495	21,523	Ero et al., 2018	Mouse	Oligodendrocytes		$49,720/2 = 24,860$			
			Hilus (DGpo)					Source	Species	Cell Type	Original	Scaled to mice		
Count	$2,817/2 = 1,408$ (PV+VIP +SST)	$280,099/2 = 140,049$	Mulders et al., 1997	Rat	53,000	21,730	Ramsden et al., 2003	Rat	All glia	102,000	29,580			
			Lister et al., 2006	Rat	49,275	20,203	Kaae et al., 2012 (FRL)	Rat	All glia	99,600	28,884			
			Sousa et al., 1998	Rat	45,000	18,450	Ero et al., 2018	Mouse	All glia	$65,962/2 = 32,981$				
Average DGmo neurons = $(1,408 + 140,049)/2 = 70,729$			Rasmussen et al., 1996	Rat	40,000	16,400	Total Glia: Sum of averages from the above studies		$(32,115+48,939+24,860) + (30,482) = 136,396$					
			Kim et al., 2017	Mouse	7,289	Total Glia Dentate Gyrus: $((103,000+94,967)/2) + (30,481) = 129,464$								
			Ero et al., 2018	Mouse	$126,772/2 = 63,386$									
			Average Hilus (DGpo) neurons = 24,635											
Murakami et al., 2018 - all cells (neurons + glia) in DGmo+DGpo (excluding granule layer) = $549,622/2 = 274,811$														
Average of Murakami and others: $((70,729+24,635+136,396) + 274,811)/2$														
<b>Total DG cells excluding granule cell layer = 253,286</b>														

b. CA2/3 (Excluding pyramidal cell layers)							
Neurons				Glia			
Source	Kim et al.,	Ero et al., 2018	Source	Species	Cell Type	Original	Scaled to mouse
Species	Mouse	Mouse	Grady et al., 2003	Rat	All glia	470,000	136,300
Count	20,060/2=10,030 (PV+VIP+SST)	127,836	Ero et al., 2018	Mouse	All glia	105,869	
Average of neurons = $(10,030 + 127,836)/2 = 68,933$				Average of glia = $(136,300 + 105,869)/2 = 121,085$			
Murakami et al., 2018 - all cells (neurons + glia) in CA2 + CA3 (excluding principal layers) = $326,876/2 = 163,438$							
Average of Murakami and others: $((121,085 + 68,933) + (163,438))/2$							
<b>Total CA2/3 cells excluding principal cell layers = 176,728</b>							

c. CA1 (Excluding pyramidal cell layer)								
Neurons				Glia				
CA1				CA1 All				
Source	Species	Original	Scaled to mouse	Source	Species	Cell Type	Original	Scaled to mouse
Bezaire et al., 2016	Rat	27,240	11,168 (Interneurons)	Grady et al., 2003	Rat	Astrocytes	190,000	55,100
				Long et al., 1998	Mouse	Astrocytes	100,000	
Ero et al., 2018	Mouse	345,910/2=172,955 (excluding principal layer neurons)		Ero et al., 2018	Mouse	Astrocytes	59,141/2 = 29,571	
				Grady et al., 2003	Rat	Oligodendrocytes	185,000	53,650
Kim et al.,	Mouse	20,572/2= 10,286		Ero et al., 2018	Mouse	Oligodendrocytes	99049/2 = 49,525	

2017	(CA1 PV+VIP+SST)	Grady et al., 2003	Rat	Microglia	95,000	27,550
		Long et al., 1998	Mouse	Microglia	48,000	
		Ero et al., 2018	Mouse	Microglia	118,872/2 = 59,436	
Averaged Neurons of CA1 except principal layer cells = (11,168+10,286+172,955)/3 = 64,803		Total glia (Sum of the averages of astrocytes, oligodendrocytes and microglia):		(55,100+100,000+29,571)/3 + (53,650+49,525)/2 + (27,550+48,000+59,436)/3 = 158,140		
Murakami et al., 2018 - all cells (neurons + glia) in CA1 (excluding principal layer) = 463,665/2 = 231,832						
Average of Murakami and others: (231,832 + (64,803+ 158,140))/2						
<b>Total CA1 cells excluding principal cell layer = 227,388</b>						

d. Subiculum								
Neurons				Glia				
Source	Species	Original	Scaled to mouse	Source	Species	Cell Type	Original	Scaled to mouse
Mulders et al., 1997	Rat	300000	123,000	Fitting et al., 2009	Rat	Astrocytes	74,432	21,585
Lister et al., 2006 (left side)	Rat	193725	79,427	Fitting et al., 2009	Rat	Oligodendrocytes	159,514	46,259
Andrade et al., 2000 (female)	Rat	300000	123,000	Ero et al., 2018	Mouse	Astrocytes	26,212/2 = 13,106	
Andrade et al., 2000 (male)	Rat	350000	143,500	Ero et al., 2018	Mouse	Oligodendrocytes	65,827/2 = 32,914	
Fitting et al., 2009	Rat	312252	128,023	Ero et al., 2018	Mouse	Microglia	50,869/2 = 25,435	
Ero et al., 2018	Mouse	435,628/2 = 217,814		Astrocyte average + Oligodendrocytes average + microglia			((21,585+13,106)/2) + ((46,259+32,914)/2) + 25,435 =	
Average of neurons from literature			135,794	Total glia			82,367	
Murakami et al., 2018 - all cells (neurons + glia) in Subiculum = 720,360/2 = 360,180								
Average of Murakami and others: (360,180 + (135,794+82,367))/2								
<b>Total cells in the Subiculum = 289,171</b>								

e. Entorhinal Cortex (Lateral + Medial)			
All cells			
Source	Species	Neurons	Glia
Herculano-Houzel et al., 2013	Mouse	400,019	574,736
Ero et al., 2018	Mouse	$1,082,511/2 = 541,256$	$626,040/2 = 313,020$
Murakami et al., 2018 - all cells (neurons + glia) in Entorhinal Cortex = $910,927/2 = 455,463$			
Average of Murakami and others: $(455,463 + ((400,019+541,256)/2) + ((574,736+313,020)/2))/ 2$			
Total cells in medial and lateral Entorhinal cortex = 684,990			