

Supplementary Table 1: Tuning property comparisons between this and previous studies^(a)

Tuning property ^(b)	This study (calcium imaging of thalamic boutons or neurons in V1)	Previous studies (extracellular recording in dLGN or V1)
Percentage of visually responsive boutons/neurons that are OS	~50%	48%-63%, depending on definition ^(c)
Tuning FWHM of OS thalamic boutons/neurons	70-82°	75.4 ^{o(c)}
gOSI of OS thalamic boutons/neurons	0.26	0.19 ^(c)
OSI of OS thalamic boutons/neurons	0.56	0.41 ^(c)
Percentage of visually responsive L4 neurons that are OS	83%	80% ^(d,e)
Tuning FWHM of OS L4 neurons	33.6°	~56 ^{o(d)}
gOSI of OS L4 neurons	Median=0.56, Mean=0.55	Mean ~0.57 ^(d)
OSI of OS L4 neurons	Median=0.78, Mean=0.74	Mean ~0.86 ^(d)
Percentage of visually responsive L2/3 neurons that are OS	83%	80% ^(d,e)
Tuning FWHM of OS L2/3 neurons	29.2°	~44 – 56 ^{o(d)}
gOSI of OS L2/3 neurons	Median=0.58, Mean=0.57	Mean ~0.56 ^(d)
OSI of OS L2/3 neurons	Median=0.78, Mean=0.74	Mean ~0.87 ^(d)
Percentage of visually responsive L5 neurons that are OS	63%	74% ^(d,e)
Tuning FWHM of OS L5 neurons	35.5°	~74 ^{o(d)}
gOSI of OS L5 neurons	Median=0.46, Mean=0.47	Mean ~0.35 ^(d)
OSI of OS L5 neurons	Median=0.73, Mean=0.69	Mean ~0.6 ^(d)

^(a)Due to their large sample sizes, data from Zhao et al., 2015 (Reference 12) and Niell et al., 2008 (Reference 35) were chosen for comparison.

^(b)Median values are used unless stated otherwise.

^(c)Zhao et al., 2015

^(d)Niell et al., 2008

^(e)Calculated from Figure 9 of Niell et al., 2008 as (linear oriented + nonlinear oriented)/(1-nonresponsive).