

V1 Layer 5 Network Model

Aug 1, 2024

Single Cells

Table 1: Cell properties

Cell	Apical Length (um)	V-Rest (mV)	R _{in} (Mohms)	Tau _m (ms)	Rheobase (pA)	FI curve slope
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Synapses

Table 2: Synaptic Properties of V1 L5 synapses[1]

Pre2Post	Latency (ms)	Rise Time (ms)	Decay tau (ms)	Rest Amp (mV)	90% Amp (mV)	STP Induction	STP Recovery
CP2CP	1.92	4.27	20.2	0.27	0.31	-0.48	-0.16
CS2CS	1.75	3.49	15.5	0.24	0.32	-0.31	-0.06
CS2CP	1.32	3.88	14.2	0.19	0.33	-0.04	-0.14
CP2FSI	1.31	2.36	10.6	1.01	1.01	-0.65	-0.23
CS2FSI	1.24	2.52	6.8	0.48	0.69	-0.47	-0.07
CP2LTS	1.33	3.36	36.6	0.05	0.43	0.11	0.07
CS2LTS	1.43	3.14	14.0	0.09	0.83	0.09	0.07
FSI2CP	0.88	4.85	50.9	-0.32	-0.32	-0.57	-0.02
FSI2CS	0.88	4.85	54.1	-0.52	-0.60	-0.59	-0.22
LTS2CP	1.26	7.99	47.9	-0.19	-0.41	-0.06	0.07
LTS2CS	1.27	7.46	58.7	-0.11	-0.26	-0.11	0.05
FSI2FSI	1.01	2.79	15.7	-0.47	-0.53	-0.50	-0.15
FSI2LTS	1.06	4.44	25.2	-0.44	-0.60	-0.33	-0.12
LTS2FSI	1.20	4.13	15.7	-0.18	-0.43	-0.13	0.04
LTS2LTS	1.41	6.83	69.9	-0.19	-0.43	-0.16	-0.02

Table 3: Synaptic Properties of model synapses

Pre2Post	Latency (ms)	Rise Time (ms)	Decay tau (ms)	Rest Amp (mV)	90% Amp (mV)	STP Induction	STP Recovery
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Connectivity

Model Output

References

- [1] Luke Campagnola, Stephanie C. Seeman, Thomas Chartrand, Lisa Kim, Alex Hoggarth, Clare Gamlin, Shinya Ito, Jessica Trinh, Pasha Davoudian, Cristina Radaelli, Mean-Hwan Kim, Travis Hage, Thomas Braun, Lauren Alfiler, Julia Andrade, Phillip Bohn, Rachel Dalley, Alex Henry, Sara Kebede, Alice Mukora, David Sandman, Grace Williams, Rachael Larsen, Corinne Teeter, Tanya L. Daigle, Kyla Berry, Nadia Dotson, Rachel Enstrom, Melissa Gorham, Madie Hupp, Samuel Dingman Lee, Kiet Ngo, Philip R. Nicovich, Lydia Potekhina, Shea Ransford, Amanda Gary, Jeff Goldy, Delissa McMillen, Trangthanh Pham, Michael Tieu, LaAkea Siverts, Miranda Walker, Colin Farrell, Martin Schroedter, Cliff Slaughterbeck, Charles Cobb, Richard Ellenbogen, Ryder P. Gwinn, C. Dirk Keene, Andrew L. Ko, Jeffrey G. Ojemann, Daniel L. Silbergeld, Daniel Carey, Tamara Casper, Kirsten Crichton, Michael Clark, Nick Dee, Lauren Ellingwood, Jessica Gloe, Matthew Kroll, Josef Sulc, Herman Tung, Katherine Wadhwani, Krissy Brouner, Tom Egdorf, Michelle Maxwell, Medea McGraw, Christina Alice Pom, Augustin Ruiz, Jasmine Bomben, David Feng, Nika Hejazinia, Shu Shi, Aaron Szafer, Wayne Wakeman, John Phillips, Amy Bernard, Luke Esposito, Florence D. DOrazi, Susan Sunkin, Kimberly Smith, Bosiljka Tasic, Anton Arkhipov, Staci Sorensen, Ed Lein, Christof Koch, Gabe Murphy, Hongkui Zeng, and Tim Jarsky. Local connectivity and synaptic dynamics in mouse and human neocortex. *Science*, 375(6585):eabj5861, 2022.