

Supporting Information

Meechan et al. 10.1073/pnas.1211507109

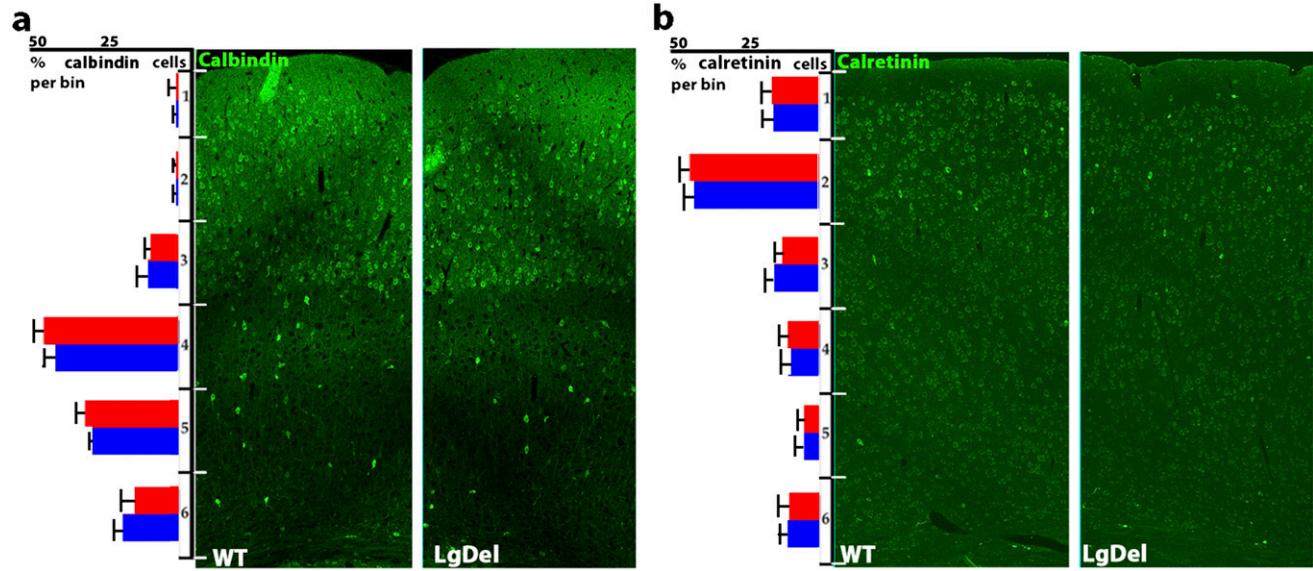


Fig. S1. Assessment of calbindin and calretinin interneuron distribution in postnatal day 21 (P21) cortex. Counting boxes (600- μ m wide, divided into equidistant bins) spanning the cortex between the pial surface and the white matter tract were analyzed in lateral, medial, and dorsal locations in coronal P21 brain sections. No significant differences were observed in the number or distribution of calbindin (A) or calretinin (B) interneurons between Large Deletion (LgDel) and WT samples. (Medial probe location is shown.)

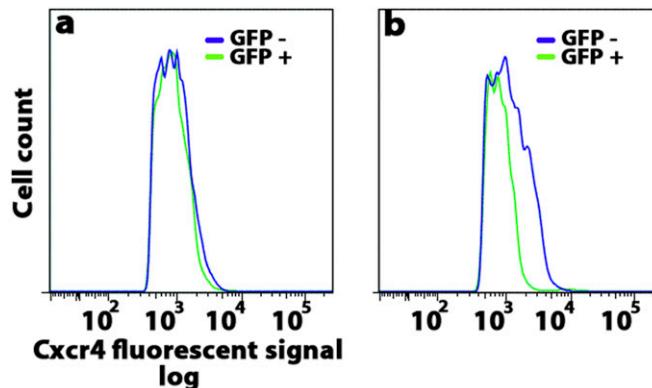


Fig. S2. Cell-surface labeling of Cxcr4 protein by fluorescently conjugated anti-Cxcr4 antibody was measured in dissociated embryonic day 14.5 (E14.5) cortical cells using flow cytometry. (A) A representative flow cytometry plot showing Cxcr4 cell-surface fluorescent signal of *Dlx5/6*-CIE-positive (green plot) and *Dlx5/6*-CIE-negative (blue plot) cortical cells dissociated from the same WT embryo. (B) A representative flow cytometry plot showing Cxcr4 cell-surface fluorescent signal of *Dlx5/6*-CIE-positive and -negative cortical cells from a WT embryo that contains one floxed Cxcr4 allele. Cxcr4 fluorescent signal is reduced only in cells that are *Dlx5/6*-CIE-positive (GFP⁺ and Cre recombinase-positive), indicating specific and successful excision of the Cxcr4 allele only in these cells.

Table S1. Microarray results of *Dlx5/6-CIE*-labeled cortical interneurons

WT signal	LgDel signal	Fold-change	Gene symbol	Gene
366.5851	720.858	0.51	Fbl	Fibrillarin
550.8332	948.8289	0.58	Ppp1r14b	Protein phosphatase 1, regulatory (inhibitor) subunit 14B
1056.56	1764.297	0.60	Dip2c	DIP2 disco-interacting protein 2 homolog C (<i>Drosophila</i>)
760.4257	1246.119	0.61	Auts2	Autism susceptibility candidate 2
1157.731	1872.705	0.62	Spp13	Signal peptide peptidase 3
962.9722	1466.667	0.66	Mark2	MAP/microtubule affinity-regulating kinase 2
1069.828	1588.752	0.67	Zfp57	Zinc finger protein 57
2096.382	3105.481	0.68	Sepw1	Selenoprotein W, muscle 1
1003.254	1400.452	0.72	Stmn3	Stathmin-like 3
2085.566	2903.5	0.72	Cux2	Cut-like homeobox 2
909.4592	1265.924	0.72	Septin3	Septin 3
711.4436	989.7512	0.72	Ctnnd2	Catenin (cadherin-associated protein), delta 2
727.4034	1002.117	0.73	Foxj3	Forkhead box J3
1042.29	1410.103	0.74	Dcakd	Dephospho-CoA kinase domain containing
1656.865	2240.173	0.74	Dlgap1	Discs, large (<i>Drosophila</i>) homolog-associated protein 1
2471.591	3331.726	0.74	Nxph1	Neurexophilin 1
1095.964	1472.2	0.74	Ctxn1	Cortexin 1
1563.04	2096.014	0.75	Vamp2	Vesicle-associated membrane protein 2
1665.494	2214.071	0.75	Chd3	Chromodomain helicase DNA binding protein 3
1445.328	1876.538	0.77	Celf3	VCUGBP, Elav-like family member 3
1295.377	1680.633	0.77	Atat1	α -Tubulin acetyltransferase 1
1588.189	2038.454	0.78	Zfp706	Zinc finger protein 706
902.6028	1156.062	0.78	Lhx6	LIM homeobox protein 6
789.4371	1010.435	0.78	Calm3	Calmudulin 3
916.0685	1153.895	0.79	Plxna2	Plexin A2
776.321	975.058	0.80	Cux1	Cut-like homeobox 1
1688.898	2116.692	0.80	Slain1	SLAIN motif family, member 1
994.4494	1245.142	0.80	Ywhah	Tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein, eta polypeptide
838.1426	1047.689	0.80	Dusp1	Dual specificity phosphatase 1
2849.227	3541.741	0.80	Tecr	Trans-2,3-enoyl-CoA reductase
825.1348	1019.732	0.81	Macrod2	MACRO domain containing 2
891.0898	1092.161	0.82	Lsm12	LSM12 homolog (<i>S. cerevisiae</i>)
1714.049	2098.656	0.82	Dlx1	Distal-less homeobox 1
1477.302	1799.967	0.82	Gad2	Glutamic acid decarboxylase 2
936.4372	1136.487	0.82	Mex3b	Mex3 homolog B (<i>C. elegans</i>)
783.369	948.7254	0.83	Ank3	Ankyrin 3, epithelial
908.9832	1088.743	0.83	Ptprd	Protein tyrosine phosphatase, receptor type, D
1117.204	1326.444	0.84	Mapk8	Mitogen-activated protein kinase 8
1116.761	1318.982	0.85	Mapk10	Mitogen-activated protein kinase 10
852.4502	1004.727	0.85	Wdfy3	WD repeat and FYVE domain containing 3
1865.172	2195.219	0.85	Myo18b	Myosin XVIIIB
2427.399	2853.562	0.85	Cxcr4	Chemokine (C-X-C motif) receptor 4
1494.997	1742.484	0.86	Efnb2	Ephrin B2
1314.085	1050.263	1.25	Syngap1	Synaptic Ras GTPase activating protein 1 homolog (rat)
1853.097	1475.546	1.26	Ube2l3	Ubiquitin-conjugating enzyme E2L 3
3327.537	2648.795	1.26	Ywhaz	Tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein, zeta polypeptide
1202.928	957.3133	1.26	Luc7l3	LUC7-like 3 (<i>S. cerevisiae</i>)
1584.821	1260.298	1.26	Tpm3	Tropomyosin 3, gamma
1855.987	1472.278	1.26	Rab2a	RAB2A, member RAS oncogene family
2443.298	1935.401	1.26	Csrnp3	Cysteine-serine-rich nuclear protein 3
1292.005	1021.467	1.26	Dact1	Dapper homolog 1, antagonist of beta-catenin (<i>Xenopus</i>)
2386.115	1880.076	1.27	Ddx5	DEAD (Asp-Glu-Ala-Asp) box polypeptide 5
1552.606	1220.51	1.27	Aff4	AF4/FMR2 family, member 4
1311.399	1028.731	1.27	Pfn2	Profilin 2
2547.238	1993.3	1.28	Nedd4	Neural precursor cell expressed, developmentally down-regulated 4
1338.838	1043.379	1.28	Camsap1l1	Calmodulin regulated spectrin-associated protein 1-like 1
1406.749	1089.912	1.29	Paip2	Polyadenylate-binding protein-interacting protein 2
1005.523	771.3785	1.30	Spin1	Spindlin 1
2187.384	1671.031	1.31	Usmg5	Up-regulated during skeletal muscle growth 5
1201.904	911.8586	1.32	Srsf3	Serine/arginine-rich splicing factor 3
2793.839	2092.908	1.33	Eif1	Eukaryotic translation initiation factor 1

Table S1. Cont.

WT signal	LgDel signal	Fold-change	Gene symbol	Gene
1754.228	1308.36	1.34	Serinc1	Serine incorporator 1
1038.844	758.7667	1.37	Wastf1	WASP family 1
2263.125	1623.408	1.39	Tra2b	Transformer 2 beta homolog (<i>Drosophila</i>)
1005.26	720.8209	1.39	Qrich1	Glutamine-rich 1
1211.67	867.3649	1.40	Nudt21	Nudix (nucleoside diphosphate linked moiety X)-type motif 21
1484.142	1057.29	1.40	Cltc	Clathrin, heavy polypeptide (Hc)
1803.751	1279.174	1.41	Rab2a	RAB2A, member RAS oncogene family
1812.269	1266.344	1.43	Wtap	Wilms' tumor 1-associated protein
1123.865	780.1495	1.44	Sumo1	SMT3 suppressor of mif two 3 homolog 1 (yeast)
1584.345	1080.222	1.47	Bzw1	Basic leucine zipper and W2 domains 1
1027.391	694.287	1.48	Rhoa	Ras homolog gene family, member A
2264.548	1520.143	1.49	Fth1	Ferritin heavy chain 1
1244.906	818.3963	1.52	Anapc13	Anaphase promoting complex subunit 13
1632.323	1070.277	1.53	Zcrb1	Zinc finger CCHC-type and RNA binding motif 1
1268.095	812.3386	1.56	Txn1	Thioredoxin 1
2653.523	1685.762	1.57	Tra2b	Transformer 2 beta homolog (<i>Drosophila</i>)
1409.271	890.9048	1.58	Dynll2	Dynein light chain LC8-type 2
1740.841	1075.011	1.62	Ap2m1	Adaptor protein complex AP-2, mu1
896.5356	546.4138	1.64	Grin1a	Glutamate receptor, ionotropic, N-methyl D-aspartate-like 1A
1073.067	652.0905	1.65	Cdkn1b	Cyclin-dependent kinase inhibitor 1B
1134.036	688.4431	1.65	Cct4	Chaperonin containing Tcp1, subunit 4 (delta)
1151.835	689.8512	1.67	Pin4	Protein (peptidyl-prolyl cis/trans isomerase) NIMA-interacting, 4 (parvulin)
1091.849	633.6619	1.72	Tpm4	Tropomyosin 4
1309.204	758.8223	1.73	Txn1	Thioredoxin 1
1153.308	654.7971	1.76	Mrpl42	Mitochondrial ribosomal protein L42
1327.469	706.6179	1.88	Actr2	ARP2 actin-related protein 2 homolog (yeast)
1533.207	725.9561	2.11	Scarna13	Small Cajal body-specific RNA 1

Table S2. Microarray results for *Dlx5/6-CIE* unlabeled cortical cells

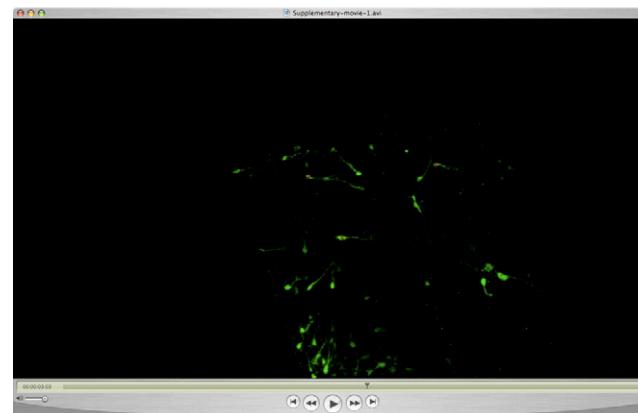
WT signal	LgDel signal	Fold change	Gene symbol	Gene
569	455	0.79	Snhg1	Small nucleolar RNA host gene (nonprotein coding) 1
722	575	0.79	Kptn	(Kaptin) actin-binding protein
693	549	0.79	Fam53a	Family with sequence similarity 53, member A
1886	1495	0.79	Wbscr22	Williams Beuren syndrome chromosome 22 protein
323	255	0.79	Arhgap10	Rho GTPase-activating protein 10
694	546	0.79	Fam131a	Family with sequence similarity 131, member A
215	169	0.79	Nubpl	Nucleotide-binding protein-like
600	470	0.78	Pnpo	pyridoxamine 5'-phosphate oxidase
1076	842	0.78	Ctd1	CTD1 auxin-responsive protein
701	546	0.78	Mybl2	Myeloblastosis oncogene like-2
338	262	0.78	Fam19a1	Family with sequence similarity 19, member A1
349	270	0.77	Ephb1	Ephrin receptor b1
276	213	0.77	Ablim3	Actin-binding LIM protein 3
1394	1067	0.77	Bok	BCL2 ovarian-related killer
2576	1972	0.77	Hes6	Hairy and enhancer of split 6
3083	2329	0.76	Ciapin1	Cytokine-induced apoptosis inhibitor 1
824	582	0.71	Mcrs1	Microspherule protein 1
666	439	0.66	Snord35b	Small nucleolar RNA c/d box
417	529	1.30	Ncam2	Neural cell adhesion molecule 2
194	253	1.30	Gpr4	G protein -coupled receptor 4
472	616	1.31	Zfp213	Zinc finger protein 213
1457	1909	1.31	Pcsk1n	Proprotein convertase subtilisin/kexin type 1 inhibitor
451	595	1.32	Rab9b	Member RAS oncogene family
138	183	1.33	Aldoart1	Alolase 1 a retrogene 1
3741	5068	1.35	Mt2	Metallothionein 2
1042	1432	1.37	Nsbp1	Nucleosomal-binding protein 1

Table S3. Primers used for RT-Quantitative PCR

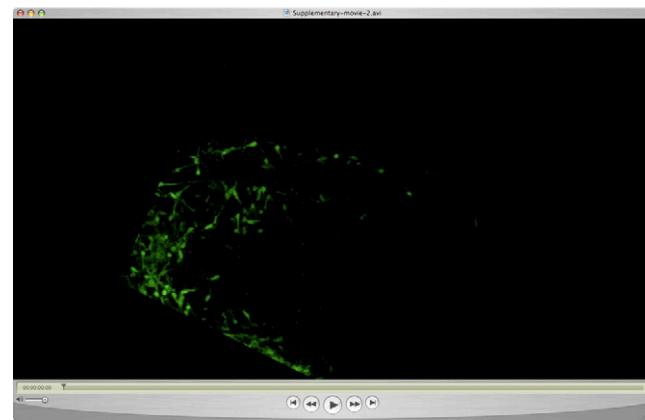
Gene	Forward	Reverse
<i>Gapdh</i>	ctgacgtgccgcggagaaa	gttggggcccgaggatagg
<i>Ranbp1</i>	gacccccagtgcgagccaatagtt	gacccccagtgcgagccaatagtt
<i>Ephb1</i>	agcccccttcgggtgtctc	agcttctggtaactccctaa
<i>Mt2</i>	gcctgcaaattgcaacaatgc	agtcgcacttgtcggaaagc
<i>Cxcr4</i>	tccaaacaaaggaaacctgtttc	ttggcgactatgccaatgg
<i>Lhx6</i>	cttcagccgatttggaaacagt	ttatgacgcgctcggcagtttg
<i>Cux2</i>	gcggcgttctgagtttat	ctggcagggtggttaccgtt
<i>Gad2</i>	tcaactacgcgttctgcac	agagtggcccttccatc

Table S4. Antibodies used for tissue immunolabeling

Antibody	Concentration	Source
Rabbit anti-calbindin	1:500	Swant
Mouse anti-calretinin	1:500	Swant
Rabbit anti-parvalbumin	1:2,000	Swant
Rabbit anti-somatostatin	1:500	Abcam
Chicken anti-GFP	1:1,000	Abcam
Mouse anti-BrdU	1:50	BD Biosciences
Rat anti-BrdU	1:50	Accurate Biochemicals
Mouse anti-Tuj1	1:1,000	Covance

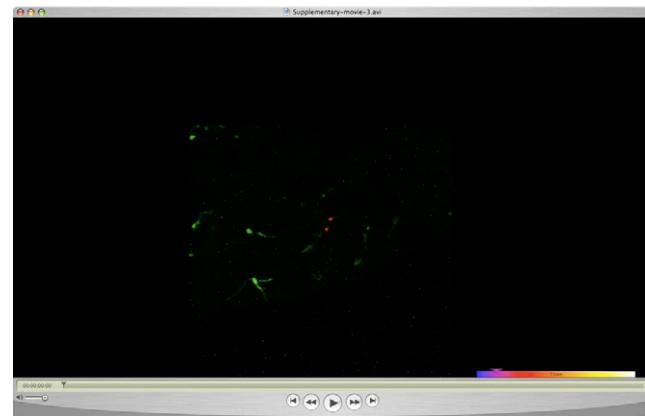
**Movie S1.** Live imaging of tangential cortical interneuron migration for 6.5 h in E13.5 WT forebrain slices using the *Dlx5/6-CIE* line. Cells of interest are indicated with red markers.

[Movie S1](#)



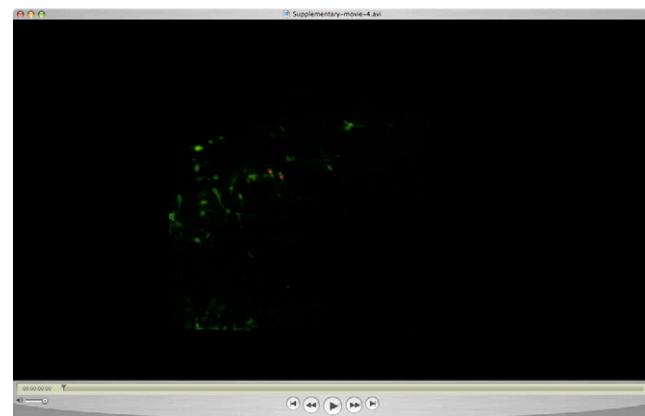
Movie S2. Live imaging of tangential cortical interneuron migration for 6.5 h in E13.5 *LgDel* forebrain slices.

[Movie S2](#)



Movie S3. Live imaging of radial cortical interneuron migration in E13.5 WT forebrain slices.

[Movie S3](#)



Movie S4. Live imaging of radial cortical interneuron migration in E13.5 *LgDel* forebrain slices.

[Movie S4](#)