KEY RESOURCES TABLE

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Reagent type** | **Designation** | **Source** | **Identifiers** | **Additional information** |
| Gene (*Homo sapiens*) | *DCC* | NCBI | 1630 |  |
| Gene (*Mus musculus*) | *Dcc* | NCBI | 13176 |  |
| Gene (*Mus musculus*) | *Ntn1* | NCBI | 18208 |  |
| Strain, strain background (*Mus musculus*) | *Dccflox/flox*, C57BL/6J | Krimpenfort et al., 2012 | N/A |  |
| Strain, strain background (*Mus musculus*) | *Dcckanga*, C57BL/6J | Finger et al., 2002 | N/A |  |
| Strain, strain background (*Mus musculus*) | *Dcc-/-*, C57BL/6J | Fazeli et al., 1997 | N/A |  |
| Strain, strain background (*Mus musculus*) | *Emx1iC****re***, C57BL/6J | Kessaris et al., 2006 | N/A |  |
| Strain, strain background (*Mus musculus*) | *Ntn1-lacZ*, C57BL/6J | Serafini et al., 1996 | N/A |  |
| Strain, strain background (*Mus musculus*) | *tdTomatoflox\_stop*, C57BL/6J | Madisen et al., 2010 | N/A |  |
| Cell line (*Homo sapiens*) | HEK293T | ATCC | RRID:CVCL\_0045 | ATCC Cat# CRL-1573 |
| Cell line (*Homo sapiens*) | U251MG | ATCC | RRID:CVCL\_0021 | Obtained as U-373MG (RRID: CVCL\_2219) but subsequently identified as U-251 via PCR-based short tandem repeat profiling. |
| Cell line (*Mus musculus*) | Neuro-2A (N2A) | ATCC | RRID:CVCL\_0470 | Obtained via the University of Queensland |
| Cell line (*Chlorocebus aethiops*) | COS-7 | ATCC | RRID:CVCL\_0224 | ATCC Cat# CRL-1651 |
| Antibody | Goat polyclonal anti-DCC | Santa Cruz Biotechnology | sc-6535, RRID:AB\_2245770 | “(1:200)” western blot; “(1:500)”immunofluorescence |
| Antibody | Goat polyclonal anti-NTN1 | R&D Systems | AF1109, RRID:AB\_2298775 | “(1:500)” western blot; “(1:500)” immunofluorescence |
| Antibody | Rabbit monoclonal anti-GADPH | Cell signaling Technology | 2118, RRID:AB\_561053 | “(1:2000)” western blot |
| Antibody | Rabbit polyclonal anti-GADPH | IMGENEX | IMG-5143A, RRID:AB\_613387 | “(1:1000)” western blot |
| Antibody | Rabbit polyclonal anti-APC | Abcam | ab15270, RRID:AB\_301806 | “(1:250)” |
| Antibody | Mouse monoclonal anti-α-DAG1 | Merk | 05-593, RRID:AB\_309828 | “(1:250)” |
| Antibody | Rabbit polyclonal anti-β-catenin | Cell Signaling Technology | 9562, RRID:AB\_331149 | “(1:500)” |
| Antibody | Mouse monoclonal anti-β-dystroglycan (MANDAG2) | Developmental Studies Hybridoma Bank | 7D11, RRID:AB\_2211772 | “(1:50)” |
| Antibody | Chicken polyclonal anti β-galactosidase | Abcam | ab9361, RRID:AB\_307210 | “(1:500)” |
| Antibody | Rabbit polyclonal anti-cleaved-caspase3 | Cell Signaling Technology | 9661, RRID:AB\_2341188 | “(1:500)” |
| Antibody | Goat polyclonal anti-DCC | Santa Cruz Biotechnology | sc-6535, RRID:AB\_2245770 | “(1:500)” |
| Antibody | Mouse monoclonal anti-GAP43 | Millipore | MAB347, RRID:AB\_94881 | “(1:500)” |
| Antiibody | Mouse monoclonal anti-GFAP | Millipore | MAB3402, RRID:AB\_94844 | “(1:500)” |
| Antibody | Rabbit polyclonal anti-GFAP | Dako | Z0334, RRID:AB\_10013382 | “(1:500)” |
| Antibody | Mouse monoclonal anti-Glast (EAAT1) | Abcam | Ab49643, RRID:AB\_869830 | “(1:500)” |
| Antibody | Rabbit polyclonal anti-Glast (EAAT1) | Abcam | Ab416, RRID:AB\_304334 | “(1:250)” |
| Antibody | Mouse monoclonal anti-KI67 | BD Pharmingen | 550609, RRID:AB\_393778 | “(1:500)” |
| Antibody | Chicken polyclonal anti-Laminin | LS-Bio | C96142, RRID:AB\_2033342 | “(1:500)” |
| Antibody | Rabbit polyclonal anti-Laminin (pan-Laminin) | Sigma | L9393, RRID:AB\_477163 | “(1:500)” |
| Antibody | Mouse monoclonal anti-N-cadherin (CDH2) | BD Biosciences | 610921, RRID:AB\_398236 | “(1:250)” |
| Antibody | Rat monoclonal anti-Nestin (NES) | Developmental Studies Hybridoma Bank | AB 2235915, RRID:AB\_2235915 | “(1:50)” |
| Antibody | Chicken polyclonal anti-Nestin (NES) | Abcam | Ab134017, RRID:AB\_2753197 | “(1:1000)” |
| Antibody | Goat polyclonal anti-NTN1 | R&D Systems | AF1109, RRID:AB\_2298775 | “(1:500)” |
| Antibody | Mouse monoclonal anti-neurofilament | Millipore | MAB1621, RRID:AB\_94294 | “(1:500)” |
| Antibody | Rabbit polyclonal anti-NFIA | Aviva Systems Biology | ARP32714, RRID:AB\_576739 | “(1:500)” |
| Antibody | Rabbit polyclonal anti-NFIB | Sigma | HPA003956, RRID:AB\_1854424 | “(1:500)” |
| Antibody | Rabbit polyclonal anti-neuronal-specific-ßIII-tubulin (TUBB3) | Abcam | Ab18207, RRID:AB\_444319 | “(1:500)” |
| Antibody | Rabbit polyclonal anti-phospho p44/42 MAPK (ERK1/2) | Cell Signaling Technology | 9101, RRID:AB\_331646 | “(1:250)” |
| Antibody | Rabbit polyclonal anti-SOX9 | Merck | AB5535, RRID:AB\_2239761 | “(1:500)” |
| Antibody | Goat polyclonal anti-TDTOMATO | Sicgen | Ab8181-200, RRID:AB\_2722750 | “(1:500)” |
| Recombinant DNA reagent | pCAG-TDTOMATO | This Paper |  |  |
| Recombinant DNA reagent | pCAG-DCC:TDTOMATO | This Paper |  |  |
| Recombinant DNA reagent | pCAG-DCCKANGA:TDTOMATO | This Paper |  |  |
| Recombinant DNA reagent | pCAG-DCCM743L:TDTOMATO | This Paper |  |  |
| Recombinant DNA reagent | pCAG-DCCV754M:TDTOMATO | This Paper |  |  |
| Recombinant DNA reagent | pCAG-DCCA893T:TDTOMATO | This Paper |  |  |
| Recombinant DNA reagent | pCAG-DCCV793G:TDTOMATO | This Paper |  |  |
| Recombinant DNA reagent | pCAG-DCCMG805E:TDTOMATO | This Paper |  |  |
| Recombinant DNA reagent | pCAG-DCCM1217V;A1250T:TDTOMATO | This Paper |  |  |
| Recombinant DNA reagent | pCAG-H2B-GFP-2A-MyrTDTOMATO | Arnold Kriegstein (UCSF) |  |  |
| Recombinant DNA reagent | p-SUPER-*Dcc*-shRNA | Xiong Zhiqi; Zhang et al., 2018 |  |  |
| Recombinant DNA reagent | pCAG-*Dcc*-CRISPR 1 | Atum; This paper |  | targeting chr18:71,954,969 - 71,955,009 |
| Recombinant DNA reagent | pCAG-*Dcc*-CRISPR 2 | Atum; This paper |  | targeting chr18:71,826,146 - 71,826,092 |
| Recombinant DNA reagent | *Fgf8* cDNA | Gail Martin, UCSF |  | In situ hybridization riboprobe |
| Recombinant DNA reagent | *Ntn1* cDNA | Helen Cooper |  | In situ hybridization riboprobe |
| Recombinant DNA reagent | *Mmp2* cDNA | This paper |  | In situ hybridization riboprobe |
| Sequence-based reagent | *Mmp-2* cDNA forward primer | Allen Brain Atlas |  | 5’-ATGGTGACCAAGAACAGAAGGT |
| Sequence-based reagent | *Mmp-2* cDNA reverse primer | Allen Brain Atlas |  | 5’-AATCACTGCTACAATCACCACG |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p.Met743Leu forward primer | This paper |  | 5’- GAGGAGGTGTCCAACTCAAGATGATACAGTTTGTCTG |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p.Met743Leu reverse primer | This paper |  | 5’– CAGACAAACTGTATCATCTTGAGTTGGACACCTCCTC |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p.Val754Met forward primer | This paper |  | 5’– TAATATAGCCTCTCACCATGATGTTTGGGTTGAGAGG |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p.Val754Met reverse primer | This paper |  | 5’– CCTCTCAACCCAAACATCATGGTGAGAGGCTATATTA |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p.Ala893Thr forward primer | This paper |  | 5’– ACTTGTACTTGGTACTGGCAGAAAAGCTGGTCCT |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p.Ala893Thr reverse primer | This paper |  | 5’– AGGACCAGCTTTTCTGCCAGTACCAAGTACAAGT |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p. Val793Gl forward primer | This paper |  | 5’– ACTAGAGTCGAGTTCTCATTATGGAATCTCCTTAAAAGCTTTCAAC |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p. Val793Gl reverse primer | This paper |  | 5’– GTTGAAAGCTTTTAAGGAGATTCCATAATGAGAACTCGACTCTAGT |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p. Gly805Glu forward primer | This paper |  | 5’– CACTTTCGTAGAGAGGGACCTCTTCTCCGGCATTGTTGAA |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p. Gly805Glu reverse primer | This paper |  | 5’– TTCAACAATGCCGGAGAAGAGGTCCCTCTCTACGAAAGTG |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p.Met1217Val;p.Ala1250Thr forward 1 primer | This paper |  | 5’– GTTCCAAAGTGGACACGGAGCTGCCTGCGTC |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p.Met1217Val;p.Ala1250Thr reverse 1 primer | This paper |  | 5’– GACGCAGGCAGCTCCGTGTCCACTTTGGAAC |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p.Met1217Val;p.Ala1250Thr forward 2 primer | This paper |  | 5’– GTACAGGGATGGTACTCACAACAGCAGGATTACTGG |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p.Met1217Val;p.Ala1250Thr reverse 2 primer | This paper |  | 5’– CCAGTAATCCTGCTGTTGTGAGTACCATCCCTGTAC |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p. Val848Arg forward primer | This paper |  | 5’– CAGCCTGTACACCTCTTGGTGGGAGCATGGGGG |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p. Val848Arg reverse primer | This paper |  | 5’– CCCCCATGCTCCCACCAAGAGGTGTACAGGCTG |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p. His857Ala forward primer | This paper |  | 5’– ACCCTCACAGCCTCAGCGGTAAGAGCCACAGC |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p. His857Ala reverse primer | This paper |  | 5’– GCTGTGGCTCTTACCGCTGAGGCTGTGAGGG |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p. p.del-P3(Kanga) forward primer | This paper |  | 5’– CCACAGAGGATCCAGCCAGTGGAGATCCACC |
| Sequence-based reagent | *Dcc* site-directed mutagenesis p. p.del-P3(Kanga) reverse primer | This paper |  | 5’– GGTGGATCTCCACTGGCTGGATCCTCTGTGG |
| Peptide, recombinant protein | *Ntn1* | R&D systems | 1109-N1 | 100ng/mL |
| Peptide, recombinant protein | *NTN1-AP* | This paper |  | Generated as supernatant from HEK293T as previously described in Zellina et al., 2014 |
| Commercial assay, kit | Click-iT EdU Alexa Fluor 488 Imaging Kit | Invitrogen | C10337 |  |
| Commercial assay, kit | QuickChange II Site-Directed Mutagenesis Kit | Stratagene | 200524 |  |
| Software, algorithm | Fiji | Fiji | RRID:SCR\_002285 |  |
| Software, algorithm | Prism | Graphpad | RRID:SCR\_002798 |  |
| Software, algorithm | Imaris | Bitplane | RRID:SCR\_007370 |  |