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| **Key Resources Table** |
| **Reagent type (species) or resource** | **Designation** | **Source or reference** | **Identifiers** | **Additional information** |
| genetic reagent (include species here) | *Dkk3-Cre* | RIKEN BRC  |  | (Sato et al., 2007) |
| genetic reagent (include species here) | *Dcc KO* | (Fazeli et al., 1997) |  |  |
| genetic reagent (include species here) | *RosaTom* | Jackson Laboratories |  |  |
| genetic reagent (include species here) | *Dcc Kanga* | Jackson Laboratories | Stock no: 029220 | (Finger et al., 2002) |
| genetic reagent (include species here) | *Dcc flox* | Dr Anton Berns |  | (Krimpenfort et al., 2012) |
| genetic reagent (include species here) | *Netrin flox* | (Moreno-Bravo et al., 2018) |  |  |
| genetic reagent (include species here) | *Dkk3-Cre;RosaTom* | This paper | N/A | N/A |
| genetic reagent (include species here) | *Dkk3-Cre;Dcc lox* | This paper | N/A | maintained on C57BL/6J background |
| genetic reagent (include species here) | *Dkk3-Cre;Ntn1 lox* | This paper | N/A | maintained on C57BL/6J background |
| antibody | Rabbit polyclonal anti-Islet1 | Abcam | Cat# Ab20670; RRID: AB\_881306 | 1:300 (IF) |
| antibody | Sheep polyclonal anti-Chx10 | Exalpha  | Cat#; X1180-PRRID: AB\_2314191 | 1:300 (IF) |
| antibody | Mouse monoclonal anti-Calbindin | Swant | Cat# 300; RRID: N/A | 1:1000 (IF) |
| antibody | Goat polyclonal anti-Chat | Abcam | Cat# Ab144b;RRID: N/A | 1:500 (IF) |
| antibody | Rabbit polyclonal anti-Rbpms  | Phosphosolution | Cat# 1830-RBPMS; RRID:AB\_2492225 | 1:500 (IF) |
| antibody | Goat polyclonal anti-Dcc (A20) | Santa Cruz | Cat# sc-6535; RRID:AB\_2245770 | 1:500 (IF) |
| antibody | Rabbit polyclonal anti-Sox2 | Abcam | Cat# Ab97959; RRID:AB\_2341193 | 1:500 (IF) |
| antibody | Mouse monoclonal anti-ßIII tubulin | Covance | Cat# MMS435P; RRID:AB\_2313773 | 1:500 (IF) |
| antibody | Mouse monoclonal anti-Crx | Abnova | Cat# H1406-M02; RRID:AB\_606098 | 1:2000 (IF) |
| antibody | Goat polyclonal anti-Pax2 | R&D systems | Cat# AF3364; RRID:AB\_10889828 | 1:300 (IF) |
| antibody | Rabbit polyclonal anti-Pax2 | Life technologies | Cat# 7160000; RRID:N/A | 1:300 (IF) |
| antibody | Goat polyclonal anti-Collagen IV | BioRad | Cat# 134001; RRID:AB\_2082646 | 1:400 (IF) |
| antibody | Goat polyclonal anti-Opn1sw | Santa Cruz | Cat# sc-14363; RRID:AB\_2158332 | 1:1000 (IF) |
| antibody | Mouse monoclonal anti-Laminin | Abcam | Cat# ab11575; RRID:AB\_298179 | 1:300 (IF) |
| antibody | Rabbit polyclonal anti-dsRed | Clontech | Cat# 632496; RRID:AB\_10013483 | 1:300 (IF) |
| antibody | Mouse monoclonal anti-Rhodopsin | Millipore | Cat# MABN15; RRID:AB\_10807045 | 1:500 (IF) |
| antibody | Rabbit polyclonal anti-Recoverin | Millipore | Cat# AB5585;RRID:AB\_2253622 | 1:1000 (IF) |
| antibody | Rabbit polyclonal anti-Opn1mw | Millipore | Cat# AB5405; RRID:AB\_177456 | 1:300 (IF) |
| antibody | Rabbit polyclonal anti-Arrestin-C | Abcam | Cat# ab-15282; RRID:AB\_1163387 | 1:1000 (IF) |
| antibody | Goat polyclonal anti-Contactin-2/TAG-1 | R&D Systems | Cat# AF4439; RRID:AB\_2044647 | 1:500 (IF) |
| antibody | Donkey Anti-Rabbit IgG (H+L) Alexa Fluor 488 AffiniPure | Jackson ImmunoResearch Labs | Cat# 711-545-152; RRID:AB\_2313584 | 1:500 (IF) |
| antibody | Donkey Anti-Rabbit IgG (H+L) Alexa Fluor 647 AffiniPure | Jackson ImmunoResearch Labs | Cat# 711-605-152; RRID:AB\_2492288 | 1:500 (IF) |
| antibody | Donkey Anti-Rabbit IgG (H+L) Cy3 AffiniPure (min X Bov,Ck,Gt,GP,Sy Hms,Hrs,Hu,Ms,Rat,Shp Sr Prot) | Jackson ImmunoResearch Labs | Cat# 711-165-152; RRID:AB\_2307443 | 1:500 (IF) |
| antibody | Bovine Anti-Goat IgG (H+L) Alexa Fluor 647 AffiniPure | Jackson ImmunoResearch Labs | Cat# 805-605-180 ;RRID:AB\_2340885 | 1:500 (IF) |
| antibody | Donkey Anti-Goat IgG (H+L) Cy™3 AffiniPure | Life technologies | Cat# A21432 ; RRID:AB\_141788 | 1:500 (IF) |
| antibody | Donkey Anti-Goat IgG (H+L) 488 | Life technologies | Cat# A11055 ; RRID:AB\_2534102 | 1:500 (IF) |
| antibody | Donkey anti-Mouse IgG (H+L) Secondary Antibody, Alexa Fluor 488 | Life technologies | Cat# A-21202 RRID:AB\_141607 | 1:500 (IF) |
| antibody | Donkey Anti-Mouse IgG (H+L) Alexa Fluor 647 AffiniPure | Jackson ImmunoResearch Labs | Cat# 715-605-150; RRID:AB\_2340862 | 1:500 (IF) |
| antibody | Donkey Anti-Mouse IgG (H+L) Alexa Fluor 647 AffiniPure | Jackson ImmunoResearch Labs | Cat# 713-165-1471; RRID:N/A | 1:500 (IF) |
| antibody | Donkey Anti-Sheep IgG (H+L) Alexa Fluor 647 AffiniPure | Jackson ImmunoResearch Labs | Cat# 713-605-147; RRID:AB\_2340751 | 1:500 (IF) |
| antibody | Donkey Anti-Sheep IgG (H+L) Alexa Fluor 488 AffiniPure | Life technologies | Cat# A11015; RRID:AB\_141362 | 1:500 (IF) |
| sequence-based reagent |  Forward-PDE6brd1 | This paper |  PCR primers | ctgcacacagacatccagtc |
| sequence-based reagent | Reverse-PDE6brd1 | This paper | PCR primers | ccatgcctggctgaagttgt |
| chemical compound, drug | Dichloromethane (DCM) | Sigma-Adrich | Cat# 270997CAS Number: 75-09-2 | N/A |
| chemical compound, drug | Dibenzyl ether (DBE) | Sigma-Adrich | Cat# 108014CAS Number: 103-50-4 | N/A |
| chemical compound, drug | Dimethyl Sulfoxide | Sigma-Adrich | Cat# D8418-250mL CAS Number: 67-68-5 |  |
| chemical compound, drug | Normal Donkey Serum | Millipore | Cat# S30-M | N/A |
| chemical compound, drug | Methanol (MeOH) | VWR Chemicals | Cat# 20847.360CAS Number: 67-56-1 | N/A |
| chemical compound, drug | Gelatin | VWR Chemicals | Cat# 24350.262CAS Number: 9000-70-8 | N/A |
| chemical compound, drug | Hydrogen peroxide solution (H2O2) | Sigma-Adrich | Cat# 216763CAS Number: 7722-84-1 | N/A |
| chemical compound, drug | Thimerosal | Sigma-Adrich | Cat# T8784-5gCAS Number: 54-64-8 | N/A |
| chemical compound, drug | Triton X100 | Sigma-Adrich | Cat# X100-500mlCAS Number: 9002-93-1 | N/A |
| chemical compound, drug | TAE buffer | Invitrogen | Cat# 15558026 | N/A |
| chemical compound, drug | Agarose | Carl ROTH | Cat# 2267.4CAS Number: 9012-36-6 | N/A |
| software, algorithm | Imspector software | LaVision Biotec |  | http://www.lavisionbiotec.com/ |
| software, algorithm | Imaris x64 software (version 9.1.2) | Bitplane | RRID:SCR\_007370 | <http://www.bitplane.com/imaris/imaris>  |
| software, algorithm | ImageJ (1.50e, Java 1.8.0\_60, 64-bit) | NIH | RRID:SCR\_003070 | <http://imagej.nih.gov/ij/>;  |
| software, algorithm | iMovie (version 10.1.1) | Apple |  | http://www.apple.com/fr/imovie/ |
| software, algorithm | Graphpad Prism | Graphpad.com | Version 7.0 | Used for statistical analysis and graph generation |
| other | Hoechst | Sigma | Cat# B2883 |  |
| other | TO-PRO-3 | ThermoFischer | Cat# T3605 | N/A |
| other | Cholera Toxin Subunit B (Recombinant), Alexa Fluor™ 647 Conjugate |  ThermoFischer | Cat# C34778  | N/A |
| other | Cholera Toxin Subunit B (Recombinant), Alexa Fluor™ 555 Conjugate |  ThermoFischer | Cat# C22843  | N/A |

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