SUPPLEMENTARY MATERIALS AND METHODS

In utero electroporation
Timed-pregnant ICR females were deeply anesthetized and the abdominal cavity cut open. Embryos were exposed in the uterus, and 1 l of a 1 g per l solution of EGFP-encoding DNA plasmid was injected into the lateral ventricle of the telencephalon through the uterine wall. Square electric pulses of 35V and 50ms were passed through the uterus five times, spaced 950ms, using a square pulse electroporator (CUY21E, Nepa GENE). DNA was specifically electroporated into the cortical hem by placing the electrodes at 45° with respect to the telencephalic midline plane, as described before. The uterine horns were placed back in the abdominal cavity, which was then suture closed and the female was allowed to recover.

Slice cultures
CXCR4 receptor blocking. AMD3100 was added to the medium of hem-substituted slices only at the beginning of the culture period, at a final concentration of 15.75 M or 31.5 M; control slices received identical volumes of vehicle solution (PBS).

Ectopic hem transplants. Oblique slices from E12.5 embryo brains were obtained as described above. A fragment of the neocortex was removed from the dorsal cortex or at the level of the pallial-subpallial boundary, and the cortical hem of GFP+ donor slices was transplanted in substitution. In all experiments slices were maintained for 2 days in vitro prior to analysis.
**Explant cultures**

For COS cell confrontation assays, COS7 cell aggregates expressing Gfp alone, or Gfp and Cxcl12 were prepared by diluting transfected cells with Matrigel in a 1:1 proportion. After jellification, COS cell aggregates were cut with a scalpel in small rectangular prisms of approximately 400x400x800 m and confronted to explants of cortical hem in Matrigel. The cDNA used for expression of Cxcl12 was obtained from Invitrogen (clone number: 3483088; accession number: BC006640).

For CXCR4 receptor-blocking experiments, AMD3100 was added to the medium only at the beginning of the culture period, at a final concentration of 3.15 M or 15.75 M; control cultures received identical volumes of vehicle solution (PBS).

**Immunohistochemistry and In Situ hybridization**

Twenty micrometer frozen brain sections, or Matrigel pads containing hem explants, were hybridized with digoxigenin-labeled probes as described before. The following cDNA probes were used in this study: Cxcl12 (clone number: 3483088, Invitrogen), Cxcr4 (clone number: 4457694, Invitrogen), Reln (generous gift of G. D'Arcangelo). For immunohistochemistry of frozen brain sections or slice cultures, the tissue was incubated with primary antibodies overnight, followed by appropriate secondary antibodies. In double labeling experiments, sections were further processed by the ABC histochemical method (Vector). Fluorescent stainings were counterstained with DAPI.
For immunohistochemistry in hem explants, cultures were fixed for 1 h in 4% PFA, incubated in 2% BSA and 0.5% TX in PB for 6 h at room temperature, and subsequently incubated with primary antibodies for 36 h at 4 °C. After washing, appropriate fluorescent secondary antibodies were used. Primary antibodies used were: anti-GFP, 1:1000 (Aves Inc.); anti-Calretinin, 1:2000 (Swant); and anti-Laminin, 1:200 (Chemicon). Secondary antibodies used were: biotinylated anti-Rabbit IgG (Vector); Alexa488 and Alexa546 anti-rabbit and anti-chicken (Molecular Probes), all diluted 1:200.

**Protein stripe assay**

Purified CXCL12 protein was obtained from PeproTech. Alternating, 50 m-wide, CXCL12-containing (10 g per l) lanes were laid down on a poly-lysine-coated plastic dish. Alexa546-labeled anti-rabbit IgGs were added to the CXCL12 protein solution for lane identification. CXCL12 and control lanes were further coated with laminin (20 g per l). Hem explants were dissected out of GFP+ brain slices as above, plated on top of the protein stripes, and incubated in methylcellulose-containing Neurobasal medium for 24 h.

Migrating cells were classified and counted as occupying a lane containing CXCL12 or not. Since large numbers of cells overlapped and migrated on top of each other in the vicinity of the explants, only cells located more than 250 m away from the explants were included in the analysis.