Supplementary Methods

Invasion Assays

Transwell permeable supports with a 6.5mm polycarbonate membrane and 8µm pores and coated with Matrigel Matrix were used to separate the upper and lower chambers of a 24-well cell culture plate (Corning). Inserts were coated with 250µg/ml Matrigel Matrix diluted in 0.01M Tris, 0.7% NaCl (pH 8.0) and incubated at 37°C, 5%CO_2 for at least 2h. Remaining coating buffer was aspirated from Transwells prior to addition of cell suspension. Cells for invasion assay were serum-starved in DMEM/0.5% FBS for 16h, trypsinized, and resuspended in DMEM/10% FBS for addition to Transwell chambers. $2x10^4$ cells were added to each Transwell chamber in a volume of 100µl and incubated for 3h at 37°C, 5%CO_2. 600µl of either DMEM/10%FBS or aRMS stem cell media [Neurobasal medium (Gibco), 1X B27 supplement (Gibco), 80ng/ml bFGF (Corning), 40ng/ml EGF (Sigma), 0.25µg/ml Insulin (Sigma)] were added to the lower chamber prior to incubation to represent an absence or presence of nutritional gradient, respectively. After incubation for 3h, all media was aspirated and cells remaining on the upper surface of the Transwell membrane were removed with 1X PBS and a cotton swab. Cells on the lower apical surface were fixed and stained with 1%(w/v) crystal violet (Sigma) in 10% EtOH/PBS for 10min prior to counting.

Quantitative Real-time PCR and Semi-Quantitative PCR

Mouse genotypes were determined by quantitative PCR (qPCR) performed on tail snips from neonates by Transnetyx (Transnetyx, Cordova, TN, USA), with the exception of the *Ink4a/Arf* allele, which was genotyped by semi-quantitative PCR. Briefly, genomic DNA was isolated from neonatal tail snips using a standard high-salt method of extraction. Tails were digested overnight at 55°C in TNES buffer with 6.35mg/mL proteinase K (Bioline), cell debris was removed with saturated NaCl, DNA was precipitated and washed with EtOH and resuspended

in sterile nuclease-free H_2O. REDTaq DNA Polymerase (Sigma) was used to amplify isolated DNA products, and cycling conditions were 95°C for 5min, [95°C for 45sec, 62°C for 45sec, 72°C for 1min] for 35 cycles, 72°C for 10min.

Immunoblotting

Cells were lysed in RIPA buffer (Sigma) with standard protease inhibitors and sonicated briefly to shear DNA. Protein concentration was measured by the Pierce™ BCA Protein Assay Kit (ThermoFisher). 30-60µg of lysate was resolved by 4-12% Novex Tris-Glycine (Invitrogen), transferred to nitrocellulose membrane, blocked with blocking buffer for fluorescent immunoblotting (Rockland Inc) and immunoblotted with primary antibodies. Membranes were incubated with an appropriate secondary fluorescent-labeled antibody and scanned using the Li-COR Odyssey imaging system.

Okadaic Acid Treatment

Treatment of cells with okadaic acid to activate MST kinases was modified from (23). Cells were seeded at 2 x 10^5 cells/well in a 6-well plate and allowed to adhere for 24 hours prior to treatment with either DMSO control or 150nM okadaic acid in DMSO for 3 hours. Cells were trypsynized, collected, and lysed according to standard immunoblotting procedure.