Optic nerves of anesthetized adult Sprague Dawley rats were surgically exposed surgically in anesthetized adult Sprague-Dawley rats through a supraorbital approach and were crushed using the aneurysm clip (YASARGIL), aneurysm clip, which was placed 2 mm behind the posterior eye pole, as described in previous reports. Using a transscleral approach, cultivated neural stem cells (NSCs) were transplanted into the subretinal space immediately after crushing the optic nerve crush using a transscleral approach. A 33-gauge G blunt needle attached to a 10-μL syringe (Hamilton, Reno, NV) was introduced tangentially introduced through the sclerotomy site into the subretinal region, causing retinal detachment, which was confirmed microscopically confirmed. The same procedure was then repeated to slowly inject a suspension of pigment epithelium-derived factor (PEDF) modified NSCs (2 μL of 2.0 × 10^5 cells). In this study, 72 rats with undergoing optic nerve injury were randomly assigned to three groups: group with receiving injections of phosphate-buffered saline (PBS) injections (n = 24), receiving group with weekly injections of PEDF injections (n = 24), and receiving PEDF-modified NSCs (n = 24). Subsequently, 0.67 nM of PEDF dissolved in 5 μL of sterile PBS was injected immediately after the optic nerve was crushed (day 0 days) and at 1 and 2 weeks and 2 weeks thereafter. All rats (from each group) were examined at each of the time point after post-injection (2 or 4 weeks). At each time point, samples were harvested and placed at each time point into a protein extraction buffer. Equal amounts of protein were denatured for 5 minutes at 95 °C in a sample buffer and were separated by sodium dodecyl sulfate polyacrylamide gel electrophoresis sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDSPAGE).