Supplementary table 1. Primer sequences used for PCR and quantitative real-time PCR

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| **Genes** | **Sequence (5’-3’)** | **Product size** |
| ***Myrf-knockdown*** | **Forward**: CTTTCTGTGTGCTCAAGGCTGGG | 651bp |
|  | **Reverse**: TTGCCTCCCTCAAGTCAGAGCT |
| ***Myrf-wt*** | **Forward**: AATGATCGTGGGCACACTGAAG | 324bp |
|  | **Reverse**: GCTAGTGCCTGAACAGTGAAGCAA |
| ***Myrf*** | **Forward**: CGGGACCTCTACATGAAGGC | 139bp |
|  | **Reverse**: GGAGTTCAGCTCCATGCTGT |
| ***Calml3*** | **Forward**: ACCACCCAAGAATTGGGCAC | 175bp |
|  | **Reverse**: GGATCTCCTCCTCGCTGTCA |  |
| ***Calml4*** | **Forward**: TCCTTCTGGCCATGCTGATG | 200bp |
|  | **Reverse**: GTCTCGCACAGGAATGGTGA |  |
| ***Krt12*** | **Forward**: CGCTGGGTCTCAGAGTGATTA | 113bp |
|  | **Reverse**: CGTTGTCAATCTGCAGGAGG |  |
| ***Krt13*** | **Forward**: AGAGGGCCAGGATGCTAAGA | 107bp |
|  | **Reverse**: ACTTTCGGAAATCTGGGCGA |  |
| ***Krt15*** | **Forward**: ACAAGGAGGTGGCGTCTAAC | 199bp |
|  | **Reverse**: AGACCGGTAATGACCCCCTG |  |

Supplementary Figure 1：(A) Representative retinal sections of HE staining showing no RPE defeats in 8-week-year old *Myrf +/−* mice and *Myrf* +/+ mice. RPE=retinal pigment epithelium (B) Representative NeuN fluorescent stain of the hippocampus showing no neuronal anomaly in 8-week-year old *Myrf +/−* mice and *Myrf* +/+ mice. Immunohistochemistry was using neun (green) and dapi (blue) antibodies. Scale bar: 50 μm.

Supplementary Figure 2: Represetative images of retinal cross-sections using SD-OCT. (A) Representative retinal SD-OCT images from *Myrf+/+* and *Myrf+/-* mice. Scale bar: 100 μm. RNFL=retinal nerve fiber layer; IPL= inner plexiform layer; INL=inner nuclear layer; OPL=outer plexiform layer; ONL=outer nuclear layer; ELM=external limiting membrane; IS=inner segment; OS=outer segment; RPE=retinal pigment epithelium. SD-OCT images were adjusted with contrast and brightness for display purposes only. The adjustment is performed not prior to quantitative image analysis. (B) Quantification of the thickness of ONL. Significant reduction of ONL thickness was detected in 4-12W *Myrf* +/- mice compared to that in *Myrf+/+* mice. n=6 mice. (C) The schematic of the ONL thickness measurements.

Supplementary Figure 3: Morphological changes in different age of *Myrf* +/- mice retina using HE staining. (A) Postnatal day 1 (P1). (B) Postnatal day 10 (P10). (C) Postnatal day 20 (P20). (D) Quantification of the thickness of ONL. Significant reduction of ONL thickness was detected in P10-PW8 *Myrf* +/- mice compared to that in *Myrf+/+* mice. n=4 retinal sections.