

Abstract

Mammalian CNS regeneration is highly restrained. While, teleost fish shows remarkable capacity of regeneration in response to damage, restoring vision. The entire retinal regeneration relies on a glial cell, Müller glia. The exact molecular mechanisms involved during the retinal regeneration remains elusive. Here, in this study we looked at the role of Matrix metalloproteinases during retina regeneration. It was found that MMP-9 is expressed in Müller glia (MG) of inner nuclear layer (INL) close to injury site at very early time points. Peak of expression observed during dedifferentiation and pre-proliferative phases and near the end of regeneration, expression returned to the basal values. mRNA in situ hybridization and PCNA immunostaining showed that a subset of proliferating and non-proliferating MG cells expresses MMP-9. Also, we observed the regulation of MMP-9 through Notch, Wnt and Hedgehog (Hh) signaling. A reduction in the number of proliferative cells was observed with knockdown mediated by MMP-9 targeting antisense morpholino, these results cumulatively suggests that MMPs plays an important role during retina regeneration.