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Arginine and Lysine rich region

**E-Suppl. Fig. 1. (A)** Multiple sequence analysis of HATs with other homologous sequences performed using ClustalW program. The highly conserved amino acids with other species of fishes are highlighted in bold and the conserved domain of RW20 was highlighted in red color and blue color. **(B)** Three-dimensional analysis of HATs protein contains helix highlighted in red color, loops are highlighted in green color, and RW20 peptide (arginine and glycine rich region) is highlighted in golden color balls. **(C)** Helical wheel arrangement of RW20 contains polar/basic amino acid colored red and non-polar amino acids colored yellow.

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**E-Suppl. Fig. 2.** Free radical scavenging activity of RW20 peptide compared with control Trolox. The data represent the percentage of **(A)** DPPH radical scavenging activity, **(B)** ABTS radical cation decolorization, **(C)** Superoxide radical scavenging activity and **(D)** Hydrogen peroxide scavenging activity of RW20 peptide. The single asterisk (\*) denotes the significant difference between control and peptide treatment (10 µM to 50 µM) at *p < 0.05* level by one-way ANOVA followed by Tukey's multiple range test. All the experiments are done in triplicates and the values are represented in mean ± SD, n = 3.



**E-Suppl. Fig. 3.** Treatment paradigm of RW20 and H2O2 exposure in zebrafish embryo and larvae. **(A)** Timeline for developmental toxicity test. **(B)** Timeline for neurobehavioral test. **(C)** Timeline for enzyme assays. **(D)** Timeline for DCFDA and acridine orange fluorescent assay in larvae.

  
**E-Suppl. Fig. 4. (A)** The mortality rate in 72 hpf zebrafish larvae. **(B)** Effect of RW20 peptide on hatching rate of zebrafish embryos. **(C)** Effects of RW20 peptide on a heart rate of 72 hpf zebrafish larvae. **(D)** Morphological abnormality observed in zebrafish larvae. Results are expressed as beats/min. Experiments were performed in triplicate, and data were expressed as mean ± standard deviation (n = 30/group). \* denotes *p < 0.05* as compared to the control.

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**E-Suppl. Fig. 5. (A)** Total SOD, **(B)** CAT activity and **(C)** MDA level in the supernatant of zebrafish larvae head pre-treated with RW20 peptide. Normal zebrafish larvae were considered as control (Untreated). Values are presented as mean ± SD (n = 30/group). \* Symbol indicated the values are statistically significant at *p < 0.05*.

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**E-Suppl. Fig. 6.** Antioxidant enzyme activity of **(A)** GSH, **(B)** GST and **(C)** GPx exhibit a prominent activity. Values are presented as mean ± SD (n = 30/group). \* Symbol indicated the values are statistically significant at *p < 0.05*.

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**E-Suppl. Fig. 7.** Estimation of NO production in oxidative stressed zebrafish larvae head portion of control and RW20 peptide pre-treated group. Values are presented as mean ± SD (n = 30/group). \* Symbol indicated the values are statistically significant at *p < 0.05*.