

Supplementary Figures

Supplementary Figure 1. Representative photomicrograph of rat cerebrum: (A) Control, and (B) vehicle rats revealing normal histoarchitecture of the neuropil and neurons. (C) D-gal-treated rats exposing shrunken darkly necrotic neurons (arrow) associated with congested blood vessel (arrowhead). (D) D-gal+RU50 - treated rats revealing improvement in the cerebral architecture with some necrotic neurons (arrow). (E) D-gal+RU100-treated rats illustrating nearly normal architecture of neuropil and neurons. Data were analyzed with a one-way ANOVA followed by Tukey's multiple comparison test. $***P < 0.001$ vs the control. $xxxP < 0.001$ vs vehicle. $+++P < 0.001$ vs D-gal. $\#P < 0.05$ vs D-gal+RU50. Error bars represent mean \pm SD. $n = 10$. H&E. Scale bar= 50 μm .

Supplementary Figure 2. Representative photomicrograph of rat hippocampus: (A) control, and (B) vehicle rats showing normal histoarchitecture of the dentate gyrus. (C) D-gal-treated rats revealing shrunken neurons with pyknotic nuclei (thick arrow), congested blood vessel (arrowhead) and hyperchromatic neurons (thin arrow). D-gal+RU50-treated (D) and (E) D-gal+RU100- treated rats revealing improved hippocampal architecture. Data were analyzed with a one-way ANOVA followed by Tukey's multiple comparison test. $***P < 0.001$ vs the control. $xxxP < 0.001$ vs vehicle. $+++P < 0.001$ vs D-gal. $###P < 0.001$ vs D-gal+RU50. Error bars represent mean \pm SD. $n = 10$. H&E. Scale bar= 50 μm .

Supplementary Figure 3. Representative photomicrograph of rat cerebellum: (A) control, and (B) vehicle rats illustrating normal histologic structure of cerebellum. (C) D-gal-treated rats revealing pyknotic Purkinje cells (arrowhead) in Purkinje cells layer (PCL), focal depletion of granule cell layer (thin arrow) in granular layer (GL) and necrotic neurons (thick arrow) in molecular layer (ML). (D) D-gal+ RU50- treated rats showing nearly normal histologic structure with a few lost (arrow) or pyknotic (arrowhead) Purkinje cell. (E) D-gal+RU100-treated rats showing normal hippocampal histoarchitecture with minimal degenerated (arrowhead) Purkinje cell. Data were analyzed with a one-way ANOVA followed by Tukey's multiple comparison test. $**P < 0.01$ and $***P < 0.001$ vs the control. $xxP < 0.01$ and $xxxP < 0.001$ vs vehicle. $+++P < 0.001$ vs D-gal. $###P < 0.001$ vs D-gal+RU50. Error bars represent mean \pm SD. $n = 10$. H&E. Scale bar= 50 μm .

Supplementary Figure 4. Representative photomicrograph of rat liver. (A) control group. (B) vehicle group. (C) D-gal group showing hydropic degeneration (thick arrow), wide congested central vein (thin arrow) and necrosis of hepatocytes (arrowhead). (D) D-gal+ RU50 group. (E) D-gal+RU100 group. Data were analyzed with a one-way ANOVA followed by Tukey's multiple comparison test. $***P < 0.001$ vs the control. $xxxP < 0.001$ vs vehicle. $+++P < 0.001$ vs D-gal. $###P < 0.001$ vs D-gal+RU50. Error bars represent mean \pm SD. $n = 10$. H&E. Scale bar= 50 μm .

Supplementary Figure 5. Representative photomicrograph of rat liver by periodic acid Schiff (PAS). (A) control group. (B) vehicle group. (C) D-gal group showing low glycogen amount (arrow). (D) D-gal+ RU50 group. (E) D-gal+RU100 group. Data were analyzed with a one-way ANOVA followed by Tukey's multiple comparison test. $***P < 0.001$ vs the control. $xxxP < 0.001$ vs vehicle. $+++P < 0.001$ vs D-gal. $###P < 0.001$ vs D-gal+RU50. Error bars represent mean \pm SD. $n = 10$. H&E. Scale bar= 50 μm .

