**Figure Legend**

**Figure 1.** **DNA construct for Tg(*TXN2*)+/0 mice.** The human thioredoxin 2 gene (*TXN2)* with 13.7 kb and 6.6 kb of the 5’- and 3’-flanking sequences was used to generate Tg(*TXN2*)+/0 mice by pronuclear microinjection of zygotes from the mating of (C57BL/6J X SJL/J)F1 females with (C57BL/6J X SJL/J)F1 males.

**Figure 2.** **Overexpression of** **Trx2 in young and old Tg(*TXN2*)+/0 mice and their WT littermates.** The levels of Trx2 protein were determined by Western blot in various tissues of 4-6 months old (Figure 2a: left) and in the liver of 22-24 months old (Figure 2b: right) Tg(*TXN2*)+/0 (closed bar) and WT (open bar) mice. Trx2 levels were significantly higher in both young and old Tg(*TXN2*)+/0 mice compared to their WT littermates (\**p*< 0.05). The data are the mean ± SEM from three to five mice.

**Figure 3. Levels of** **Trx1, glutaredoxin, and total glutathione in Tg(*TXN2*)+/0 and WT mice**. The levels of Trx1 (Figure 3a: left), glutaredoxin (Figure 3b: center), and total glutathione (Figure 3c: right) were measured in the liver of 4-6 months old Tg(*TXN2*)+/0 (closed bar) and WT mice (open bar). No significant difference was observed in Trx1, glutaredoxin, or total glutathione in Tg(*TXN2*)+/0 mice compared to WT mice. The data in figures 3a-3c are the mean ± SEM from three to five mice.

**Figure 4. Hydrogen peroxide production in young and old Tg(*TXN2*)+/0 and WT mice.** The Amplex Red assay was performed in the skeletal muscle of 4-6 months (Figure 4a: left) and 22-24 months old **(**Figure 4b: right) Tg(*TXN2*)+/0 (closed bar) and WT (open bar) mice. Under different experimental conditions, H2O2 production was significantly less in mitochondria from both young and old Tg(*TXN2*)+/0mice compared to WT mice (\**p*< 0.05). The values are the mean ± SEM of five mice per group.

**Figure 5.** **Levels of F2-isoprostanes and DNA oxidation in Tg(*TXN2*)+/0** **and WT mice.** F2-isoprostanes levels were measured in plasma samples from 4-6 months old (Figure 5a: left) and DNA oxidation (8-oxodG) in liver from 4-6 months old (Figure 5b: right) Tg(*TXN2*)+/0 (closed bar) andWT (open bar) mice. The F2-isoprostane levels were significantly lower in Tg(*TXN2*)+/0 mice than in WT control mice (\**p*< 0.05). Levels of DNA oxidation in the livers of Tg(*TXN2*)+/0 and WT mice showed no significant difference. The data are the mean ± SEM from five mice.

**Figure 6. The survival curves of Tg(*TXN2*)+/0 and WT mice.** The survival curves, mean, median, and 10th percentile lifespans (days), and percent differences of Tg(*TXN2*)+/0 (closed squares) and WT (open triangles) mice are presented. The cohort consists of 19 Tg(*TXN2*)+/0 and 22 WT male mice. The survival curves did not show a significant difference between Tg(*TXN2*)+/0 and WT mice (*p*> 0.05). Tg(*TXN2*)+/0 mice had a slightly longer mean (8.2%), median (8.9%), and 10th percentile (8.1%) lifespans compared to WT mice, which were not statistically significant (*p*> 0.05).

**Figure 7. Tumor burden and severity of lymphoma in Tg(*TXN2*)+/0** **and WT mice.** The number of different types of tumors, tumor burden (Figure 7a: left) and the severity of lymphoma (Figure 7b: right) in Tg(*TXN2*)+/0 (closed bar) and WT (open bar) mice were compared at 22-24 months old. The cohort consists of 23 Tg(*TXN2*)+/0 and 19 WT male mice. The tumor burden for the Tg(*TXN2*)+/0 mice is similar to WT mice and the severity of lymphoma is slightly higher in Tg(*TXN2*)+/0 mice compared to their WT littermates, which were not statistically significant (*p*> 0.05).

**Figure 8. Levels of** **c-Fos and c-Jun in Tg(*TXN2*)+/0 and WT mice**. The levels of c-Fos (Figure 8a: left) and c-Jun (Figure 8b: right) were measured in the liver of 4-6 months old Tg(*TXN2*)+/0 (closed bar) and WT mice (open bar) by Western blot. The c-Fos and c-Jun levels were significantly higher in Tg(*TXN2*)+/0 mice than in WT control mice (\**p*< 0.05). The data are the mean ± SEM from three to five mice.

**Figure 9.** **Levels of mTOR in Tg(*TXN2*)+/0** **and WT mice.** The levels of phospho-p70S6K1 (Figure 9a: left) and phospho-4E-BP1 (Figure 9b: right) were measured in the liver of young (4-6 months old) Tg(*TXN2*)+/0 (closed bar) and WT (open bar) mice by Western blot analysis. The levels of phospho-p70S6K1 and phospho-4E-BP1 were similar between Tg(*TXN2*)+/0 and WT mice (*p*> 0.05). The data are the mean ± SEM from three to five mice.

**Figure 10.** **Levels of NFκB p65 and NFκB p50 in Tg(*TXN2*)+/0** **and WT mice.** The levels of NFκB p65 (Figure 10a: left) and NFκB p50(Figure 10b: right)were measured in the liver of young (4-6 months old) Tg(*TXN2*)+/0 (closed bar) and WT (open bar) mice. The levels of NFκB p65 and NFκB p50 were similar between Tg(*TXN2*)+/0 and WT mice (*p*> 0.05). The data are the mean ± SEM from three to five mice.