

Supplementary Materials

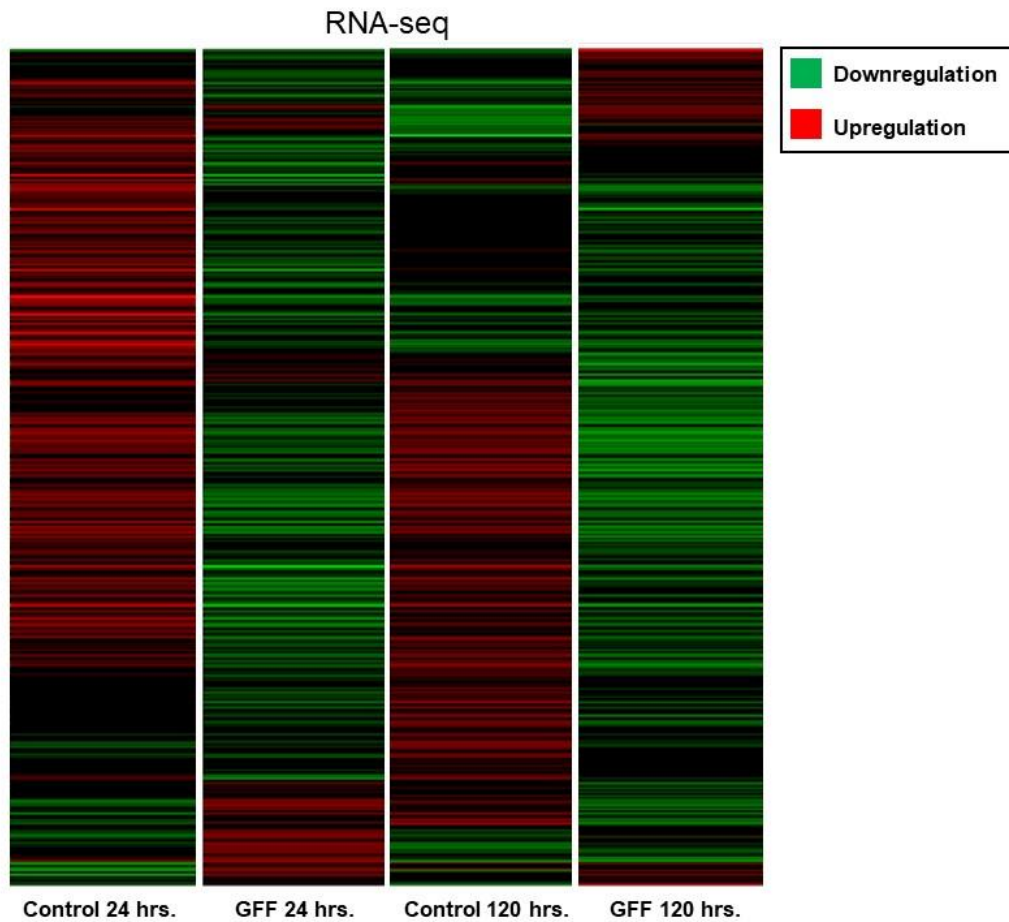


Figure S1: GFF effect on gene transcription in NHEM.

RNA-seq heat maps visually illustrate notable quantities of genes in NHEM modulated due to treatment with 10% GFF-B at both 24 and 120 hours (5 days). At 24 hours, 3,574 genes were altered by 2-fold and 533 of those genes had p-values ≤ 0.05 . At 120 hours, 3,466 genes were modulated by 2-fold and 572 of those genes had p-values < 0.05 . Green indicates downregulation, red indicates upregulation, and black indicates no change; the intensity of the color indicates the fold change degree of the modulation, $n=1$.

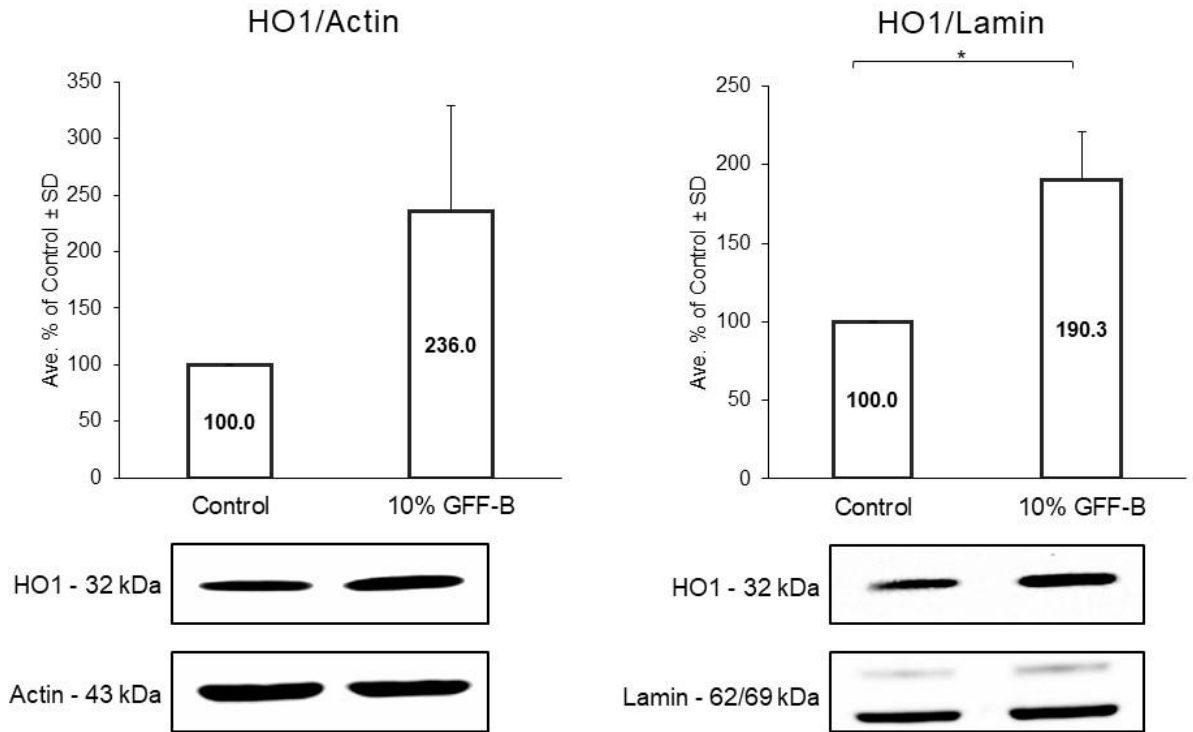


Figure S2: Cytoplasmic and nuclear HO1 expression.

HO1 expression was increased in both the cytoplasm and nucleus of NHEM treated with 10% GFF-B for 8 hours.

Results are expressed as a percentage of the control. * $p < 0.05$, SD, $n = 3$.

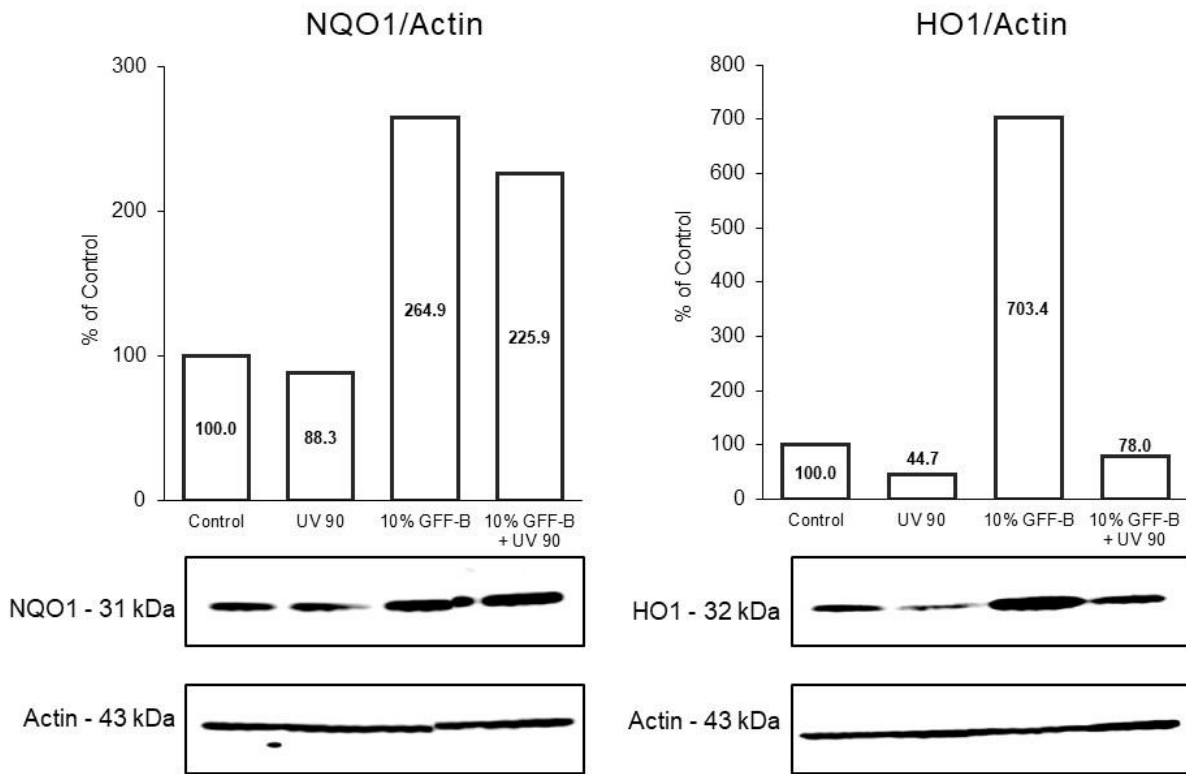


Figure S3: GFF effect on Nrf2-ARE pathway challenged by UVB.

Lightly pigmented NHEM were pretreated with 10% GFF-B for 6 days. Cells were irradiated with UVB (90 mJ/cm²) while in PBS and then immediately rescued with or without 10% GFF-B for an additional 24 hours. At harvest, cells were processed with Western blot and densitometric analyses, n=1. NQO1 expression was maintained with GFF-B treatment post-irradiation 2-fold over untreated, irradiated cells. HO1 was highly inducible with GFF-B treatment alone, yet expression was not maintained post-irradiation. Results are expressed as a percentage of the control.

Table S1 – RNA-seq antioxidant enzyme targets – 24 hours.

■ Upregulation ■ Downregulation

| Gene ID | Control | GFF-B | Fold Change | p-value |
|---------------|---------|---------|-------------|---------|
| HMOX1 | 94.40 | 350.65 | 3.71 | 0.0003* |
| NQO1 | 1623.61 | 3328.54 | 2.05 | 0.024* |
| TXNRD1 | 652.28 | 1307.26 | 2.004 | 0.024* |

Table S2 – RNA-seq antioxidant enzyme targets – 120 hours.

■ Upregulation ■ Downregulation

| Gene ID | Control | GFF-B | Fold Change | p-value |
|--------------|---------|---------|-------------|---------|
| HMOX1 | 92.51 | 260.48 | 2.82 | 0.002* |
| NQO1 | 1327.87 | 3885.33 | 2.93 | 0.0002* |

Table S1 and S2 – RNA-seq antioxidant enzyme targets. 10% GFF-B treatment for 24 hours and 120 hours (5 days) significantly upregulated mRNA levels of antioxidant enzymes from the Nrf2-ARE pathway that are involved in ROS neutralization. Significance: Fold Change ≥ 2 , *p<0.05.