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**EFFECT OF HYPEROXIA ON HEME OXYGENASE-1  
EXPRESSION IN MOUSE LUNG**

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**Introduction:** Heme oxygenase-1 (HO-1) is a key enzyme in heme catabolism, oxidatively clearing heme to yield biliverdin, iron, and carbon monoxide. (1) In many models, a protective role for heme oxygenase-1 (HO-1) also known as heat shock protein 32 (HSP 32), has been demonstrated and HO-1 is considered an oxidant-responsive protein. (2) In the present study, we investigated HO-1 expression in mice exposed to prolonged hyperoxia.

**Methods:** After institutional approval per NIH/APS guidelines, C57BL/6 female mice (8–10 wk old) were placed in a Plexiglas chamber through which 100% oxygen flowed at a continuous rate of 10 liters/min. The concentration of oxygen was maintained at 95%, as measured using an oxygen analyzer for a period of 8, 24, 48 or 72 hours. At the designated time point, mice were euthanized before harvesting of the lungs en bloc. The lungs were immediately processed for RNA isolation and RT-PCR was performed to quantify HO-1 and HO-2 expression. Densitometric RT-PCR data was normalized to HO-2 bands (which did not change) and data was analyzed using ANOVA. N=3 for all three experimental conditions.

**Results:** The HO-1 expression at 24 and 48 hours was decreased compared to control values ( $9.6 \pm 8.9$  and  $10 \pm 6.1$  vs.  $14.3 \pm 7.8$

respectively). At 72 hours the HO-1 expression increased to  $22 \pm 4.6$ . Despite the trends, none of these values reached statistically significant differences from control.

**Discussion:** The lack of significant induction of HO-1 RNA after hyperoxia in wild type (C57BL/6 mice) in our study may be an indication of the variance in oxidant stress response in the lungs, which is determined in part by the genetic as well as the phenotypic background of the organism. (3) Others have reported different responses based on species, age and in transgenic animals of the same species. Given the wide distribution of this enzyme in systemic tissues and the diverse physiological activities of the catalytic by-products; bilirubin, iron, and carbon monoxide, HO-1 is an intriguing stress-response protein which may play important roles in organ protection and injury. Further investigation into the biology of heme oxygenase is warranted.

**References:**

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