

# SUBCHRONIC ACRYLAMIDE TREATMENT INDUCES SUPEROXIDE DISMUTASE 1 EXPRESSION IN RAT LIVER

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## Introduction

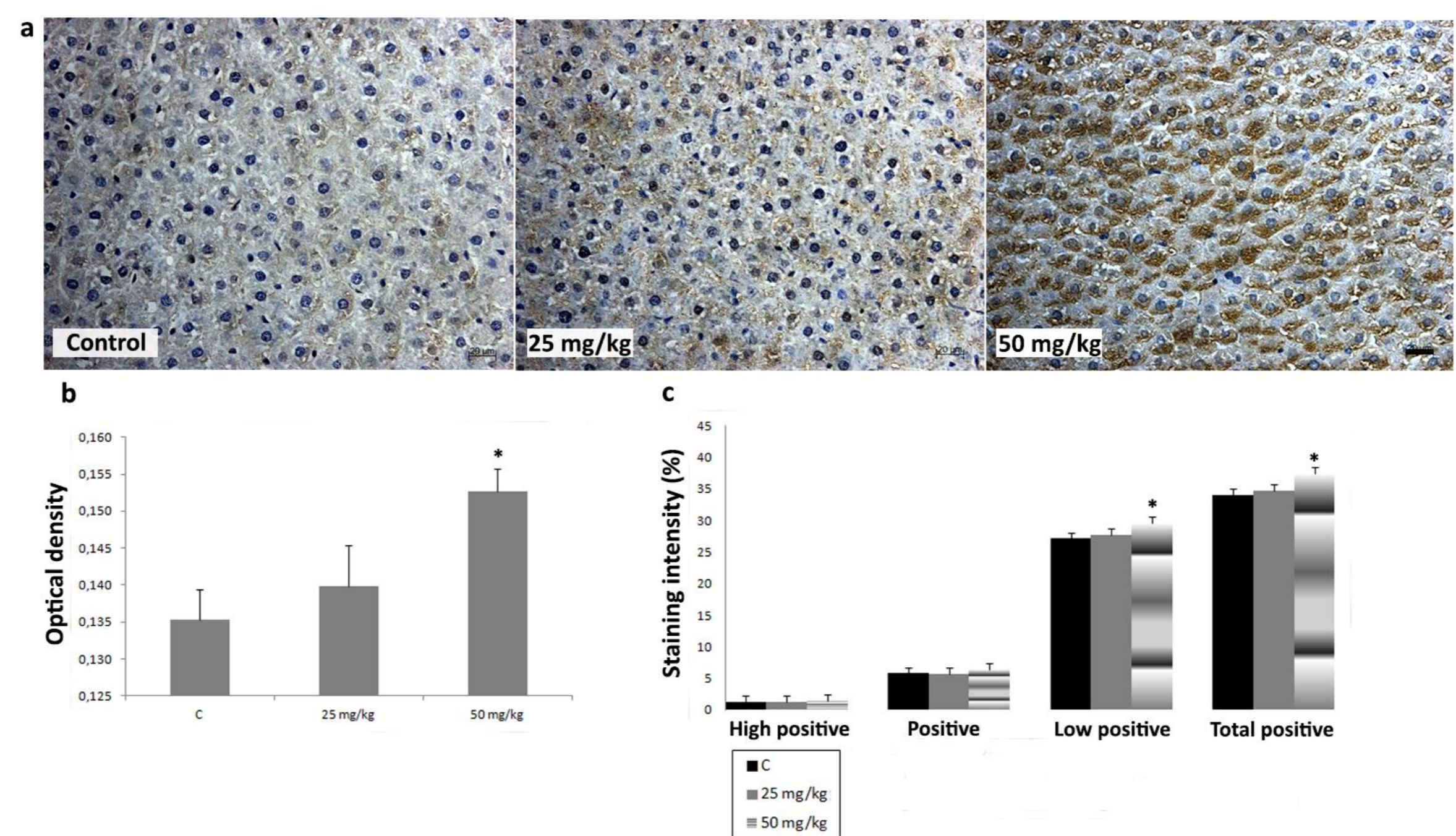
- Acrylamide (AA) is carcinogen, mutagen and neurotoxic substance present in fried, roasted and baked starch-based goods.
- AA is formed in Maillard reaction from asparagine and carbonyl sources, such as reducing sugars, during thermal food processing at temperatures between 120 and 180°C.
- The objective of our study was to determine whether acrylamide treatment affects superoxide dismutase 1 (SOD1) expression in rat liver.

## Material and methods

- Adult male Wistar rats were subchronically treated with 25 mg/kg or 50 mg/kg body weight of acrylamide.
- Formalin-fixed paraffin-embedded liver tissue was cut into 5 µm thin sections and immunostained with anti-SOD1 antibody.
- The amount of SOD1 in immunostained sections was determined using Windows based ImageJ program.
- The optical density (OD) and stained percentage color area of immunolabeled SOD1 were measured.

## Results

Immunostaining of SOD1 in liver of control rats showed weak cytoplasmic immunoreactivity in hepatocytes. AA application induced dose-dependent increase of immunostaining intensity. Significant increase of OD and percentage contribution of low positive and total positive cells of immunostained SOD1 was detected in group treated with AA in a dose of 50 mg/kg.



**Figure 1.** Representative micrographs of superoxide dismutase 1 (SOD1) immunohistochemical staining in liver of control rats, rats treated with acrylamide (AA) in dose of 25 mg/kg b.w., and rats treated with acrylamide in dose of 50 mg/kg b.w. (a). Optical density of SOD1 immunopositive cells in control and AA-treated rats in doses of 25 mg/kg b.w. and 50 mg/kg b.w. (b). Percentage contribution of high positive, positive, low positive and total positive immunohistochemical staining of SOD1 in control and AA-treated rats in doses of 25 mg/kg b.w. and 50 mg/kg b.w. (c). Values in charts are means  $\pm$  SEM; n = 10, \*p < 0.05. In statistical analysis AA-treated animals were compared with the control group.

## Conclusion

Acrylamide by changing SOD1 expression potentially affects redox balance in the liver.