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**Title:** Antioxidant systems in rat trachea upon thermal and chemical burns of upper airway

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**Body:** In the structure of burn traumatism the inhalation injury remains one of the most severe and difficult for diagnostics and treatment acute distresses. Biochemical experiments were carried out on tracheal epithelium damaged for 50%, which corresponded to 8 sec of hot vapor influence or 10 min in acid vapors. The dynamics of expression of all the major antioxidant enzymes has been evaluated in rat trachea during the first days after the inhalation injury – catalase, superoxide dismutase (SOD1–SOD3), glutathione peroxidase (GPx1-GPx8), peroxiredoxins (Prx1-Prx6). As a fixed point we used the housekeeping gene EF-1. In the case of chemical injury on the first day after the burn a significant decrease in expression (5-10 times) was observed for all the enzymes, except catalase and peroxiredoxin 6 (Prx6). On the third day after the burn the expression level for all the antioxidant enzymes increased by 30-50% of normal state; on day 7 the expression of antioxidant enzymes reached the highest level, being 2-10 times higher compared to normal state. Catalase exhibited particularly high expression level (30 times increase), SOD2 was increased in 6 times, Gpx1 and Gpx3 – in 10 times, Prx 1 and Prx6 – in 6 times. On day 15 after the injury the expression levels of antioxidant enzymes was mainly 50-70% of normal state, except Prx6, which had expression level 3 times exceeding the control. Thus, during the first days after burn injury, decreased expression level of antioxidant enzymes is observed (days 1-3), followed by a sudden increase of their expression (day 7) and subsequent normalization in 15 days. Similar results were also obtained for thermal inhalation injury.