

## Proteomic changes in rat brain cortex following acrolein toxicity

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**Background and Aims:** Acrolein (2-propenal), the most reactive of the  $\alpha,\beta$ -unsaturated aldehydes, is a toxic compound produced in automobile exhaust gases, overheated cooking oils and a metabolite of cyclophosphamide. Acrolein can also be endogenously formed as a product of lipid peroxidation. The Studies have shown, due to acrolein high reactivity, it plays an important role in the development of oxidative damage and increased in pathological conditions associated with oxidative stress, such as spinal cord injury and Alzheimer's disease. The mechanisms by which acrolein causes oxidative damage and neurotoxicity are not completely defined. Toxicoproteomics, is regarded as a highly complex screening technology provide a novel way to determine biomarker and pathophysiological changes in target organs.

**Methods:** In this study, 2 groups male wistar rats were administered distilled water (control) and acrolein (3mg/kg) orally. Cortical region of brain tissues were homogenized and the proteins were separated by two-dimensional polyacrylamide gel electrophoresis. The gels were stained with silver nitrate. Comparative image of scanned gels were analyzed by using of the image master software. Several proteins expression was changed significantly compared to the control. The protein spots were detected by Mass spectrometry.

**Conclusions:** The expressions of the 30 proteins were considerably changed in acrolein toxicity. Mass spectrometry identification of the protein spots could provide a more specific understanding of molecules and cellular pathways involved in acrolein induced neurotoxicity.

**Keywords:** Acrolein; Neurotoxicity; Proteomics