(Bmal1) or changed in phase (Per1, Per2, Cry2) while in the case of Clock significant 24-h variations were induced. CdCl2 augmented mean levels of mRNA of Clock, Cry1 and Cry2. The results indicate that the inherent transcription, translation, and post-translational modifications that give the clock its own natural rhythmicity can be disrupted in rats drinking a low amount of CdCl2 in tap water.

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R09

Assessment of arsenic levels in hair samples of residents in Ankara

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Arsenic is a ubiquitous metalloid in the environment, and it is inevitable to be exposed to at least low levels of arsenic. Chronic exposure can cause cancerous and non-cancerous health hazards in a dose–responsive pattern. Arsenic is known to be deposited in hair. Therefore, hair arsenic is the best biochemical indicator to detect chronic exposure. The primary concern of this study was to investigate whether Ankara inhabitants are under the risk of chronic arsenic exposure or not. For this purpose an atomic absorption spectroscopy method is developed and validated for assessment of arsenic concentrations in human hair. Hair samples of occipital region of the head were collected from 94 volunteers living in Ankara at the age interval of 18–74. Three-stepped acid digestion method was applied for hair samples. Electrothermal hydride generation module was utilized for atomization. Hair-arsenic levels ranged between 0.021 and 0.367 μg/g. whereas average value was 0.115 ± 0.006 μg/g. Findings were statistically evaluated according to age, gender and smoking habits of individuals. Arsenic levels in smokers (0.134 ± 0.012 μg/g) were significantly higher than non-smoking group of volunteers (0.102 ± 0.006 μg/g, $p < 0.05$). Also, the age and gender appeared to be effective on As levels analyzed in hair. Significantly higher values of As were obtained in males (0.132 ± 0.009 μg/g) than in female individuals (0.094 ± 0.008 μg/g, $p < 0.01$). It was observed that hair As levels increased significantly with age as well ($p < 0.05$).

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Keywords: AAS; Arsenic; Hair; Hydride generation module

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R10

Renal superoxide dismutase activity in mice exposed to acute and subacute cadmium intoxication: The role of magnesium pretreatment

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Available data indicate that the mechanism of cadmium (Cd) toxicity involves changes in the activities of superoxide dismutase (SOD). Previous investigations indicate beneficial effect of magnesium (Mg) supplementation on Cd effects. The objective of the study was to determine the effect of increased oral magnesium pretreatment on SOD activity in kidney of mice exposed to Cd.

Swiss albino male mice were divided into three groups: I – control group: not treated animals; II – Cd group: animals given single oral dose of 20 mg Cd/kg; III – Mg+Cd group: mice given orally 40 mg Mg/kg 1 h before Cd treatment. The animals were sacrificed by decapitation at 4, 6, 12, 24 and 48 h. In subacute experiments one group of animals was the control, the other group of mice was intoxicated orally, every day for 1 or 2 or weeks with 10 mg Cd/kg while the third one was pretreated with 20 mg Mg/kg before Cd intoxication. SOD activity was determined by method of Misra and Fridovich.

The obtained results show that acute Cd intoxication induced significantly decreased SOD activity in kidney after 6 h ($P < 0.001$), 12 h ($P < 0.05$) and 24 h ($P < 0.001$), as well as after 1 week ($P < 0.001$) of Cd treatment. Contrary, pretreatment with Mg induced no alteration of SOD activities at these intervals. Two weeks treatment with both Cd and Mg + Cd even increased SOD activity in the kidney of mice. This finding suggests the development of a adaptive/defence response of the organism to Cd exposure.

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R11

Geochemical modelling of metals species in coastal water using PHREEQCI

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Speciation of 10 metals was studied in the coastal water of Ondo State, Nigeria using modelling software (PHREEQCI). Ten metals, Na, Ca, K, Mg, Fe, Cu, Mn, Zn, Cd, Pb were evaluated along with other general water quality parameters from 10 sampling sites. The results were input data used for the modelling. The outcomes revealed that the macronutrient metals exist as free ions thus aiding the reduction of free ion species of toxic metals while the micronutrients exist as neutral or complex salts with lower toxicity. The self purification capacity of the coastal water was reflected and aided by the abundant formation of Fe-hydroxide precipitates; high alkalinity, pH and high salinity of the coastal water which are responsible for the reduction of free ions species of Pb and Cd and their ecotoxicity. Therefore, the coast's biogeochemistry enhanced demobilization of the metal contaminants and favours the reduction of their toxicity.

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R12

Effect of crude *Chromolaena odorata* leaf extract alone and in combination with sodium arsenite in mice

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In this study, the clastogenicity of aqueous extract of *Chromolaena odorata* in the presence and absence of sodium arsenite was assessed in mice using the micronucleus assay. The activities of gamma glutamyl transferase (g-GT) and alkaline phosphatase