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## **In vivo assessment of sevelamer administration in aluminum phosphide poisoning**

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**Aim and objectives:** Amino-functionalized mesoporous silica was synthesized, characterized, and applied as an adsorbent and antidote agent of methotrexate (MTX) in in vitro and in vivo assessment.

**Methodology:** Different techniques, such as FTIR and XRD, analyzed the mesoporous silica structure. The texture parameters were determined by the N<sub>2</sub> adsorption/desorption technique. The morphology was examined by using field emission and transmission electron microscopy. Prepared materials showed to have high porosity and with nano-sized pores. The in vivo experiments were performed on mice models that were over-dosed with MTX. Serum biomarkers of organ injury were assessed. **Results:** An in vivo animal study was performed to assess efficiency of MS-NH<sub>2</sub> in MTX adsorption in mice that were overdosed by MTX. By administering 30 mg/kg of MTX to the mice the overdose animals were prepared. MTX administration was associated with significant organ injury in animals, as judged by a sharp increase in the serum levels of LDH, creatinine, blood urea nitrogen (BUN), alanine aminotransferase (ALT), and aspartate aminotransferase (AST). However, the serum biomarkers of the injury were significantly decreased by the administration of synthesized MS-NH<sub>2</sub> (1 and 10 mg/kg). Overall, the results of MS-NH<sub>2</sub> administration (1 and 10 mg/kg) revealed a sharp decrease in the hepatic tissue damage induced by MTX.

**Conclusions:** In conclusion, several features of synthesized MS materials were identified in the current study. The MS-NH<sub>2</sub> proved to have a high capacity in adsorbing MTX. On the other hand, the in vivo experiments displayed the prepared material's notable function in alleviating MTX's toxicity in poisoned animal models.