

Cellular acidosis in rodents exposed to cadmium is caused by adaptation of the tissue rather than an early effect of toxicity

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Abstract

Proton (^1H) Nuclear Magnetic Resonance (NMR) spectroscopy was used to investigate the biochemical response of bank voles and wood mice (two wild rodent species that are frequently found on metal-contaminated sites) to chronic cadmium (Cd) insult. Similar effects, in terms of both metabolic changes (consistent with cellular acidosis) and induced metallothionin (MT) production were observed in all animals. These changes appeared to be an adaptation of the liver to toxic insult rather than onset of a toxic effect, and, in common with previous studies, were more marked in bank voles than wood mice in common with previous studies. This may have reflected the greater Cd intake and assimilation of the former but was not explained by differences in concentrations of free (non MT-bound) Cd; concentrations of which were negligible in voles and mice. Responses to Cd insult were detected in both species even though their bodies contained cadmium concentrations well below the World Health Organisation critical renal concentration of 200 $\mu\text{g/g}$ dry weight.

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