



Head's epithelial cells play a crucial role in the middle ear. Understanding the mechanisms underlying lead toxicity in the middle ear may offer new interventions for mitigating its detrimental effects.

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that lead exposure compromised their overall health and survival. Additionally, morphological changes, such as cellular shrinkage and membrane damage, were observed in lead-treated cells. These findings suggest that lead-induced toxicity impacts the structural integrity of middle ear epithelial cells, potentially impairing their function in maintaining ear health [5, 6].

Furthermore, lead exposure upregulated the expression of genes related to inflammation, oxidative stress, and cell damage in middle ear epithelial cells. This suggests that lead triggers an inflammatory response and induces oxidative stress in these cells, contributing to their dysfunction and potential damage. The increased production of pro-inflammatory cytokines, such as IL-6 and TNF- α , further supports the notion of an inflammatory response in lead-exposed middle ear epithelial cells.

The findings of this study align with previous research on the toxic effects of lead on epithelial cells in other organ systems. Lead-induced cellular damage, inflammation, and oxidative stress have been reported in respiratory and gastrointestinal epithelial cells. The similarities in cellular responses across different epithelial cell types indicate that lead has broad toxic effects on epithelial cells throughout the body [7].

Understanding the impact of lead on middle ear epithelial cells is crucial for several reasons. First, the middle ear epithelium plays a vital role in maintaining the health and functioning of the middle ear. Disruption of this epithelial barrier and compromised cell viability may lead to increased susceptibility to middle ear infections and hearing loss.