

Characterizing cisplatin-induced ototoxicity using LA-ICP-MS

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Cisplatin is one of the most widely-used chemotherapy drugs in the clinical treatment of ovarian, testicular, lung, head, and neck cancers. Obtaining the optimum cisplatin dose in cancer patients is sometimes limited due to side effects, including hearing loss, which is permanent. Humans and mice treated with cisplatin show elevated Pt in their cochleas, compared to age-matched controls.

Laser ablation ICP-MS is used to generate high resolution elemental maps which show the Pt distribution throughout the cochlea in cisplatin-treated mice. Improvements in the speed of transport between ablation site and plasma (Bloodhound from ESI) have improved the spatial resolution and speed with which images can be generated. Cisplatin is shown to be localized in the organ of Corti, stria vascularis, and the auditory nerve. Understanding where Pt is concentrated may allow for the development of new therapies to prevent accumulation and hearing loss.