

SOURCE REFERENCES: DENTAL TOXICITY

According to Ribeiro et al., "Genotoxicity is the capacity of an agent to produce damage in the DNA molecule. Considering the strong evidence for a relationship between genetic damage and carcinogenesis, evaluation of genotoxicity induced by dental materials is necessary for elucidating the true health risks to patients and professionals. The purpose of this article was to provide a comprehensive review of genotoxicity induced by dental materials. All published data showed some evidence of genotoxicity, especially related to dental bleaching, restorative materials and endodontic compounds. Certainly, such information will be added to that already established for regulatory purposes as a safe way to promote oral healthcare and prevent oral carcinogenesis." ([SOURCE](#))

The definition of Cytotoxic: Toxic to cells, cell-toxic, cell-killing. Any agent or process that kills cells. There are many studies on dental materials that show the cytotoxicity of these commonly used materials.

Sjogren et al investigated the Cytotoxicity of Dental Alloys, Metals, and Ceramics Assessed by Millipore Filter, Agar Overlay, and MTT Tests as follows:

Statement of problem: *Biocompatibility of dental materials is dependent on the release of elements from the materials. In addition, the composition, pretreatment, and handling of the materials influence the element release.*

Material and methods: By using cells from a mouse fibroblast cell line and the agar overlay test, Millipore filter test, and MTT test, cytotoxicity of various metals, metal alloys, and ceramics for dental restoration were studied. Effects of altering the composition of a high noble gold alloy and of pretreatment of a ceramic-bonding alloy were also studied. In addition, the release of elements into the cell culture medium by the materials studied was measured using an inductively coupled plasma optical emission spectrophotometer. The results of the MTT test were analyzed statistically using ANOVA and Scheffé test at a significance level of $P < .05$.

Results: Specimens manufactured from materials intended for dental restorations and handled in accordance with the manufacturers' instructions were ranked from "noncytotoxic" to "mildly cytotoxic" according to the agar overlay and Millipore filter tests. For the MTT test, no significant differences were observed between these materials and controls, with the exception of JS C-gold and unalloyed titanium. The modified materials were ranked from "mildly cytotoxic" to "moderately cytotoxic" in the agar overlay and Millipore filter tests and from "noncytotoxic" to "moderately cytotoxic" in the MTT test. Thus, cytotoxicity was related to the alloy composition and treatment. The release of Cu and Zn seemed to be important for the cytotoxic effect.

Conclusion: Alterations in the composition and the pretreatment can greatly influence the cytotoxicity, and the results stress the importance of carefully following the manufacturers' instructions when handling dental materials.

[SOURCE A](#) [SOURCE B](#)
[SOURCE C](#) [SOURCE D](#)
[SOURCE E](#) [SOURCE F](#)

[SOURCE G](#) [SOURCE E](#)
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