Induction of differentiation in HL-60 leukemia cells by HEMA, TEGDMA and Bis-GMA.

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A number of chemically distinct compounds induce differentiation of HL-60 human promyelocytic cell line as, for example, all trans-Retinoic Acid, DMSO, 1,25-dihydroxy-vitamin D3, anthracyclines and bezafibrate. During differentiation, HL-60 cells stop growing, and acquire the ability to form reactive oxygen species as shown by the appearance of a chemiluminescence (CL) response dependent on PMA stimulated respiratory burst.

In endodontic and restorative materials, molecules such as 2-hydroxyethylmethacrylate (HEMA), triethylene glycol dimethacrylate (TEGDMA) and 2,2-bis[4-(2-hydroxy-3-methacryloxy)-phenyl]propane (Bis-GMA) are present. In clinical use, these compounds are polymerised by chemical or photochemical reactions but a certain amount of monomers is released in the pulp cavity where they can induce inflammatory reactions and cellular damage. The aim of the present study was to determine the differentiating effect of these monomers on HL-60 cell line.

HL-60 cell line cultures were incubated for five days with different concentrations of monomers and after incubation the cells were processed for CL. The results obtained show that all the monomers considered inhibit the growth of the cell culture and induce a significant expression of CL while no response was obtained in the absence of the monomers. These results indicate that the monomers considered inhibit the proliferation of the HL-60 cell line and induce its differentiation.