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## Cytocompatibility of root canal sealers with different compositions and setting mechanisms on human periodontal ligament stem cells.

**Statement of the problem:** Root canal sealers are responsible for the principal functions of the final root filling; which are sealing-off of the root canal system, entombment of the remaining bacteria and filling of irregularities in the prepared root canal system. An ideal sealer should be biocompatible, bacteriostatic, does not shrink on setting, insoluble in oral fluids and in case of extrusion from canal, it should be biocompatible. However, all root canal sealers exhibit some form of toxicity irrespective of their type. Therefore, cytotoxicity of sealers remains an issue even though newer sealers have been introduced due to their high biocompatibility. The purpose of this study was to assess the cytocompatibility of two root canal sealers; GuttaFlow 2 based on polydimethylsiloxane and incorporating gutta percha powder, and EndoSequence which is a pre-mixed paste based on calcium-phosphate-silicate.

**Methodology:** Human periodontal ligament stem cells (hPDLSCs) were isolated, cultured and their mesenchymal phenotype characterized by flow cytometry. The invitro potential for multilineage differentiation of the hPDLSCs was analyzed in osteogenic, adipogenic and chondrogenic media. The proliferation rate of the hPDLSCs growing in the presence of the endodontic sealer eluates was evaluated using the MTT assay, in which 3 dilutions were prepared and cell viability was analyzed after 1, 3 and 7 days of culture growth.

**Results:** Both GuttaFlow 2 and EndoSequence BC supported stem cells survival and showed comparable non-significant excellent proliferation rates ( $p>0.05$ ).

**Conclusion and significance:** GuttaFlow 2 root canal sealer and EndoSequence BC Sealer were biocompatible with hPDLSCs and can be used during root canal obturation.

### Biography

Working currently as a professor at the Faculty of Dentistry. The British University in Egypt. Director of the Post-graduate Master program in Endodontics at the British University in Egypt. Director of the Center of Innovative Dental Sciences (CIDS) at the British University in Egypt. A Key opinion leader for VDW and Woodpecker, an active Board member of the Egyptian Association of Endodontics. An Editorial board member for the Australian Endodontic Journal and Endodontic Practice Today. Reviewed for Australian Endodontic Journal, Archives of Oral Biology, Odontology, Endodontic Practice Today, ACTA Odontologica Scandinavica, BMJ open, Clinical Oral Investigation, Iranian Endodontic journal, European Endodontic journal, Egyptian Dental Journal and Alexandria Dental journal. Research interests include tooth morphology and CBCT, tissue engineering and regenerative endodontics, endodontic biofilms, pain control, Bio ceramics, instruments and instrumentation, and cell culture. Published more than 30 international publications since 2009 in the Journal of Endodontics, International Endodontic journal, Endodontic practice Today, European Journal of Dentistry, and Journal of Oral Science, Italian Endodontic journal, Clinical oral investigations, Infection and immunity.

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