

4<sup>th</sup> World Congress on

# DENTISTRY AND MAXILLOFACIAL SURGERY

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## ***In vivo* biocompatibility of Bioactive Glass (BG) based sealer in embryonic Zebrafish (Danio rerio) model**

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**Statement of the Problem:** In dentistry, bioceramics have become incredibly popular as dental materials with a wide range of clinical uses, including root-end fillings, sealers, perforation repair, etc. Toxicology testing is essential due to the vast and growing need for biocompatible materials in dentistry. Animal models have gradually taken the place of the more commonly used tests for establishing the toxicity profile, such as cell culture, usage tests etc. as they have illustrated a better understanding of the toxicity of dental materials prior to their use in humans. The requirement to extract diverse and well-articulated data for further comprehension and correlation with human models renders the quest for new models to evaluate biocompatibility of interest. Zebrafish (*Danio rerio*) have recently come to light as a viable solution for these concerns. In fact, zebrafish embryos and mammalian embryos share fundamentally comparable embryonic development characteristics, making zebrafish a model for vertebrate development.

**Aim:** The purpose of this study is to analyze the biocompatibility of bioactive glass based sealer, NISHIKA Canal Sealer BG using a novel embryonic zebrafish *in vivo* model.

**Methodology:** Commercially available Bioactive glass (BG)-based sealer, Nishika Canal Sealer BG (CS-BG; Nippon Shika Yakuhin Co., Ltd., Yamaguchi, Japan) was assessed for its biocompatibility. Biocompatibility analysis was performed in embryonic zebrafish with the help of standard toxicity assays measuring essential parameters like survivability and hatching. Mechanistic and comparative analysis of toxicity was performed by oxidative stress analysis by measuring ROS induction and Apoptosis in Zebrafish exposed to this sealer at different concentrations.

**Conclusion:** This study provides a new vision and standard in dental material sciences for assessing the biocompatibility of potential novel and commercially available dental materials.

### **Recent publications**

1. Trope, M., Bunes, A.L.F. and Debelian, G. (2015) Root filling materials and techniques: bioceramics a new hope? *Endod. Top* 32, 86–96.
2. Debelian, G. and Trope, M. (2016) The use of premixed bioceramic materials in endodontics. *G. Ital. Endod* 30, 70–80.
3. Makkar, H., Verma, S. K., Panda, P. K., Pramanik, N., Jha, E. and Suar, M. (2018) Molecular insight to size and dose dependent cellular toxicity exhibited by green synthesized Bioceramic nanohybrid with Macrophages for dental application. *Toxicol. Res. (Camb). Advance artice* (In press).

### **Biography**

Antarikshya Prabir Das from the very undergraduate days of her career has been inclined and passionate towards research and under her belt she has been awarded. She was awarded the Dr. Rafiuddin Ahmed award and a Gold medalist in B.D.S in 2018. Also she was awarded the Dental Talent of the Year (West Zone) award at PHD Chamber of Commerce and Industry, New Delhi, India by the International Exemplary Research and Performance awards (IERP) 26th Feb, 2018; Indian Society of Periodontology merit award for highest marks in Periodontology, by Listerine Sep 2017 to list a few. She was recently awarded best scientific presentation at 12th IFEA

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World Endodontic Online Congress 2021 in August 2021. Currently she is pursuing her career in the field of Conservative dentistry and Endodontics. Her major thrust area of work is on the Dental materials used in Conservative Dentistry and Endodontics mainly nanoparticles (NPs) and their interaction and biocompatibility with the human tissue. At such a tender age of her career she has also contributed as an author to few National and International Journals. She aims to continue her journey in this path to improve the oral health and wellbeing of the society.

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