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# Novel indentation methods to investigate the tribomechanical behavior of ceramic-based dental materials

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## Abstract

We present recent advances in the application of the indentation method to characterize the mechanical properties and wear resistance of ceramic-based materials used in dental implants. Investigated systems include zirconia, glass-ceramics, and ceramic-polymer composites. Controlled tests with varied indenter shapes and configurations (axial, sliding, rotational) at different length-scales enable the determination of key mechanical properties such as fracture strength, toughness, friction, and wear rates. Experimental findings are analyzed within the framework of indentation and fracture mechanics, highlighting the influence of material microstructure. These efforts aim to predict short- and long-term mechanical degradation in dental prostheses and provide insights for developing more durable materials.

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