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Effect of Plasma Pretreatments on the Bio-adhesive Functionalized by Biomimetic Catechol Groups to Human Dentin SANGBAE LEE, KWANGMAHN KIM, KYOUNGNAM KIM, Yonsei University — Plasma pretreatments have been introduced for modifying the surface chemistry of biomaterials. In an effort to improve the strength of the human dentin/bio-adhesive joint, oxygen plasma pretreatments to the bio-adhesive were investigated. Plasma treatments were carried out using custom-built and low pressure. Dentin were treated with plasma and used to prepare lap shear tests. Bio-adhesives were prepared synthesizing dopamine methacrylamide (DMA) monomer. DMA were copolymerized with 2-methoxyethylacrylate (MEA) by free radical polymerization. Proton nuclear magnetic resonance ($^1\text{H-NMR}$) and Gel permeation chromatography (GPC) analysis on samples of synthesized *p*(DMA-*co*-MEA) was performed to confirm that the resulting materials had the desired chemical structure. The effects of plasma pretreatments on surface chemistry were studied using Fourier transform infrared analysis (FTIR), and contact angle measurements. Oxygen plasma pretreatments enhanced adhesive strength by oxidizing of the catechol residue and creating a cross-linking as compared with control group. Furthermore plasma pretreatments lead to increase hydrophilicity of copolymers. Prospectively, the great potential of advanced technology in creation of the “Plasma pretreatment to the DOPA adhesives” would lead to the development of versatile method for coating to medial devices as well as dentin bonding.

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