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Physical and Biochemical Mechanics of the Dental Bacteria Biofilm and Polyphenols as Plaque Inhibitors YONG WOONG LEE, YEJIN KIM, JAE WON LIM, Choice Research Group — The cause of periodontitis is different from other diseases caused by single pathogenic microorganisms. Accumulation of different types of bacteria that forms dental plague or dental film causes the periodontal disease. Microbial molecules and oral fluids make their way into enamel by slowly diffusing through a pellicle. Adaptive changes and interactions of the microorganisms in this complex make them resistant to antimicrobial agents. In this research, molecular mechanisms of bacterial adhesion in the dental bacteria biofilm were biophysically studied. To figure out how the microorganisms such as Streptococcus mutans are able to adhere to the acquired pellicles, biochemical examination of the plaque site occurred by bacterial accumulation on teeth was carried out. In the present paper, computational modeling was employed to find the electrostatic and hydrophobic interaction of a component of bacterial protein's side chain and a component of the acquired pellicle. In addition, polyphenols, which inhibit the formation of plaque caused by the Streptococcus mutans, were computationally modeled and biochemically analyzed to find their bond properties and enthalpy of formations.

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