



Enterococcus faecalis and Biofilm Formation

Mazin S Salman^{1*} and Ridha M Kadim²

¹PhD in Medical Microbiology, Ministry of Education and Scientific Research, Iraq

²Basra Gifted School, Iraq

*Corresponding Author: Mazin S Salman, PhD in Medical Microbiology, Ministry of Education, Iraq.

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Enterococcus faecalis are present as a normal flora in the intestines of humans and animals, respiratory tract, also found in soil and water [1]. The clinical importance of this type of bacteria increased during the 1990s due to its diversity Infections that cause, as it was found to be responsible for about (90%) of the injuries caused by human enterococci, and their pathogenicity is related to their ability to produce many Virulence factors, which include Cytolysin, hemolytic enzymes, sex pheromone, and adhesion factors Lipase, protease, bacteriocin, and others [2]. *Enterococcus faecalis* in addition is high and multiple antibiotic resistance and disinfectants, which made it one of the main pathogens causing nosocomial infections. *E. faecalis* are opportunistic pathogens known for their ability to form biofilms. A biofilm is a collection of bacteria of one or several species. They are adherent to the surface and covered with homologous extracellular materials that are composed mainly of carbohydrates. This type of growth protects the attached bacteria from the host's immune system also increases the resistance of bacteria to many antibiotics. The biofilm is involved in many chronic infections, including endocardial and urinary tract infections and the ductus arteriosus as well as for pneumonia. The biofilm explains the correlation between these bacteria with such materials that implanted or added to the human body, including urinary catheters, intravascular catheters, Prosthetic heart valves and bile drains. It has been proven that these bacteria have the ability to form a biofilm on the surfaces of these materials, which helps the bacteria to survive inside the host. These bacteria also have the ability to regenerate the biofilms inside the tooth root canal, and in the tops of the periodontal [3], which makes these bacteria able to endure the harsh environmental conditions in the tooth root canal

in injuries to the tooth root canal and the area around the root apex. Biofilm formation in addition to antibiotic resistance as a result of these bacteria possessing antibiotic resistance genes that they obtain as a result of spontaneous mutations or as a result of acquiring resistance genes from other organisms that make them resistant to treatment, making these bacteria a real problem, especially in some difficult-to-reach places such as in the tooth root canal. Recently, strains of enterococci bacteria have appeared that are resistant to antibiotics such as vancomycin [2]. The role of biofilm formation in pathogenicity of *E. faecalis* is under reported and requires further investigation. There are several virulence factors that are related to formation of biofilm by *E. faecalis*. The enterococcal surface protein (esp) h an important role in *E. faecalis* biofilm formation while *E. faecalis* aggregating substance (agg) was found to promote biofilm formation [4,5].

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