Antibacterials should not be administered routinely for caries prophylaxis, but rather only when conventional plaque control is likely to be ineffective. There are many different antibacterial agents on the market, but there are few agents with an evidence-based long-term anticaries effect.

Most bacteria live naturally in bacterial communities called biofilms. A biofilm is a bacterial, surface-associated community embedded in an extracellular matrix consisting of proteins, carbohydrates and extracellular DNA. Dental plaque is a typical example of a bacterial biofilm. Unlike many classical infectious diseases, caries is associated with the resident oral microbiota. A change in biofilm ecology due to factors such as more frequent sugar intake and/or lack of an mechanical plaque control leads to increased growth of the bacteria associated with caries development.

To prevent dental caries, there has been a long, ongoing search for agents to control dental biofilms. A major obstacle to be overcome is that, when bacteria are growing in biofilms it requires up to 1000 times higher concentrations of an antibacterial agent to kill these bacteria compared to planktonic (free floating) bacteria. This partly explains the high in vitro antibacterial efficacy of many compounds that lack in vivo clinical efficacy against bacteria growing in biofilms on teeth. Living in a biofilm protects bacteria from antibacterials in several ways: by retarded and reduced penetration of the agent; by binding compounds to the extracellular matrix; by enzymatic breakdown; by reduced growth rate of the biofilm bacteria, and by expression of efflux pumps that enable active transport of the antibacterial compound, thereby avoiding intracellular toxic concentrations.

In light of the global increase in antimicrobial resistant bacteria, it’s of concern that some antibacterials may contribute to selection for cross and co-resistance to clinical relevant antibiotics.

Read more:
THE NEW REAL TIME POLYMERASE CHAIN REACTION DETECTION SYSTEM AT NIOM

The real time polymerase chain reaction (PCR) detection system opens up new possibilities for research at NIOM. The instrument have several applications including identification of single nucleotide polymorphism, identification and quantification of microorganism from different samples and investigations of gene expression in mammalian cells and bacteria.

Polymerase chain reaction (PCR) is a common technique in modern molecular biology for amplifying DNA in order to obtain sufficient DNA for qualitative and quantitative detection. Conventional PCR is an end-point analysis where the amplified DNA is detected as bands on an agarose gel, while real-time PCR detects DNA by fluorescence at each amplification cycle as it occurs (real time). This enables measurement of fluorescence in the exponential phase of amplification, where ideally there is a doubling of product for each cycle, and thus gives a more accurate quantification compared to the end point PCR.

The real time PCR detection system has the possibility to discriminate up to five different targets in one reaction well. The new system will increase our understanding of transcriptional events in cells and bacteria after exposure to compounds used in dental materials or to products used in dentistry.

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