5th International Conference on

Advances in Chemical Engineering & Technology

October 04-05, 2018 | London, UK

Antibacterial activity of free and liposome encapsulated photosensitizers against oral cavity bacteria

Margarita Barel Ariel University Israel, Israel

Oral cavity is a suitable environment for the bacteria, viruses, fungi and protozoa. Most common dental diseases are tooth decay, periodontitis and other chronic infections, caused by bacteria of normal oral vegetation. These illnesses arise when these bacteria grow in number and irritation exceeds the threshold of host protection. A microbial layer has been defined as, oral bacteria stimulating a formation of a diverse microbial community on the tooth surface. The presence of oral bacteria in the mouth easily stimulates the formation of dental plaque, which accumulates on hard and soft tissues of the teeth. Although regional colonization and invasion of bacteria are strictly controlled by the dynamic balance between the dental plaque and the host's innate defense mechanisms, a subterranean layer may cause an imbalance in the immune system that result in an inflammatory response to gingivitis which can cause periodontal pockets and destruction of connective tissues and bone. Due to antibiotic resistance of bacteria there is a need to seek for alternative ways to treat infections of the oral cavity, gum disease and systemic diseases as they caused by bacteria. Photodynamic therapy is one of the methods of destruction and inhibiting bacterial growth. This treatment is based on illumination of light-excited compounds, photosensitizers, which transfers the energy to the dissolved aqueous phase oxygen. In the present work, the effect of free and liposome encapsulated photosensitizers is examined against various microorganisms of the oral cavity. Antimicrobial photodynamic therapy may become an alternative way to treat local infections under external illumination, such as chronic ulcers and various oral cavity infections. Encapsulation of photosensitizers into liposomes increases treatment efficiency and reduces toxicity of the drugs.



Figure 1: Effect of rose Bengal in liposome and rose Bengal free on S. salivarius. Streptococcus salivarius: Gram-positive colonies (usually in chains) in the oral cavity and upper respiratory tract of humans.

Recent Publications:

- 1. J Lee, Y H Nho, S K Yun and Y S Hwang (2017) Use of ethanol extracts of *Terminalia chebula* to prevent periodontal disease induced by dental plaque bacteria. BMC Complement. Altern. Med. 17:1–10.
- 2. E Horká, R Foltán and J Špac (2010) Mechanism of increased mortality in hemodialysed patients with periodontitis. Med. Hypotheses 74:374–376.
- 3. AV Kshirsagar, et al. (2009) Periodontal disease adversely affects the survival of patients with end-stage renal disease. Kidney Int. 75(7):746–751.
- 4. J A Aas, B J Paster, L N Stokes, I Olsen and F E Dewhirst (2005) Defining the normal bacterial flora of the oral cavity. J Clin. Microbiol. 43(11):5721–5732.
- 5. X Li, K M Kolltveit, L Tronstad and I Olsen (2000) Systemic diseases cause by oral infection. Am. Soc. Microbiol. 13(4):547–558.

Biography

Margarita Barel has her expertise in evaluation and passion in improving the health and wellbeing. She has a Bachelor's Degree (BSc) in Chemistry and Biotechnology Engineering (2008–2011) from the Ariel University and is pursuing her Master's Degree (MSc) in Chemistry Engineering (2016–2018) at the same university. Her professional experience: (2014–2016) VeriFone, Inc. Assistant Intellectual Property; (2011–2013) Teva Pharmaceutical Industries Ltd. and (2006–2008) as a Microbiologist in a microbiological laboratory.

margo209@gmail.com