Fast and cheap test for detection of Streptococcus pyogenes and Streptococcus pneumoniae with antibiotic resistance identification

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Abstract

We present the development and implementation the Point-of-Care devices for the rapid identification of Streptococcus pyogenes and Streptococcus pneumoniae with simultaneous identification of antibiotic resistance genes. These bacteria are the main etiological factor of acute pharyngitis, palatine tonsils, scarlet fever, pneumonia, meningitis and development of sepsis, with high mortality and dangerous complications. In cases of alleged streptococci infection, antibiotics are used, and only in the absence of positive treatment results an antibiogram is requested and results are available after a few days. During this time, untreated infection can lead to significant deterioration of a patient's health. The main advantage of the developed test will be fast identification of the bacteria from the throat swab with simultaneous analysis of the antibiotic resistance profile. As a result, the initial treatment will use antibiotics to which the strains are not resistant, leading to fast patient recovery. Results will be available after up to 30 minutes during the medical appointment. The innovation of the developed test will concern both the polymerase used for amplification of DNA and the approach to resistance testing. Innovation of the concept of drug resistance testing involves the study of not only the resistance genes within the detected bacteria but also the examination of the patient's natural bacterial flora. The presence of β-lactamase-encoding genes that will protect streptococci against antibiotics from the ampicillin group widely used in the treatment of this type of infection will be also identified.

Biography:

Anna Wyrzykowska has completed his PhD from Adam Mickiewicz University in Poznan, Poland in 2019. Now she is working as a researcher at the Electrochemistry Laboratory in the Institute of Biotechnology and Molecular Medicine, Gdansk, Poland.

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