Abstract

Abstract

**An experimental study to determine the chemical nature of substance that induces transformation in pneumococcal types**

**Background.** For many years biologists are trying different chemical methods to induce specific changes in microorganisms that can be transmitted as a hereditary character. **Aim:** The present study is conducted to find the chemical nature of the substance that induces the transformation of different types of pneumococcal. A stock laboratory strain of Pneumococcus Type III (A66) is used as source material to obtain the active principle. **Methodology:** From Type III pneumococci, deoxyribonucleic acid was isolated that can transform unencapsulated R variants of pneumococcus type II into encapsulated type III cell. The unencapsulated R strain was obtained from a Pneumococcus Type II virulent culture. The culture conditions that were required for the process of the transformation were nutrient broth, serum fluid, R Pneumococcus strain, and extraction and purification of the transforming principle. The procedure involves material sterilization that was done by alcohol use as this has no effect on activity followed by the centrifugation, and heating process for 30 min at 65°C. Heat-Killed Cells were then extracted and washed with saline. Removal of capsular polysaccharide was done followed by alcohol fractionations. **Results:** In this study among 4 four different variants that were isolated only R36A was susceptible to the potent extracts transforming action. Quantitative titrations have shown that only 10- 15% of active material was lost in washing. Different analyses such as enzymatic and serological analyses along with electrophoresis, ultraviolet spectroscopy, and ultracentrifugation show that the active fraction contains no protein, serologically reactive polysaccharide and unbound lipid. It consists totally of viscous highly polymerized desoxyribonucleic acid. The results presented in this study showed that nucleic acids possess different types of specificities as demonstrated by the selective action of transformation. The results also showed that material transforming activity is an inherent nucleic acid property but for a biological specificity chemical of its action is also important. Qualitative chemical analysis was carried out. Biuret and Millon test results came out to be negative and the Dische diphenylamine reaction was strongly positive. **Conclusion:** The results presented in this study showed that a nucleic acid of deoxyribose type is a fundamental unit pneumococcus type III principle.