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An Alternative Therapy with Xylitol and Fluoride Even in Antigenic Variation

Sunil Palchaudhuri*, Sreeja Chakraborty, Tripti Bhattacharya

Wayne State University, Michigan, USA and Atlanta Health and Welfare Centre for Women, Kolkata, India.

***Corresponding author**

Sunil Palchaudhuri,
Wayne State University, Michigan,
USA and Atlanta Health and Welfare Centre for Women,
Kolkata,
India.

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Abstract

We have developed an alternative but preventive therapy to save our children and the elderly from the attack of two serious pathogens Streptococcus mutans (dental diseases) and Streptococcus pneumoniae (respiratory diseases). This therapy uses low calorie sugar Xylitol (2% or more) with fluoride at a concentration of 100 ppm or less. These two bacterial pathogens Streptococcus mutans (dental diseases) and Streptococcus pneumoniae (respiratory diseases) are related by their low G-C content. We have determined their growth curves. They grow in three phases: pre-competent, competent and post- competent. These serious pathogens have already become resistant to our antibiotics and also capable of causing antigenic variation.

***Material & Method:** In microbiology text books there are two classes of bacteria: Gram-positive and Gram negative. They are classified by the Gram staining technique. Briefly aniline dye (crystal violet) is added and stained for 60 seconds and then removed by washing with acetone-alcohol mixture. After fixing with iodine and counter stain is added. Gram positive bacteria become purple and the Gram -negative looks pink. We also used two well characterized bacteria as our internal controls. All other techniques are well defined in details but in the articles of Palchaudhuri, previously published.*

Introduction

In 1928, Dr Fred Griffith observed two colonies when he had streaked blood samples on blood agar medium immediately after collection from his patients with lobar pneumonia, usually caused by the Gram-positive pathogen Streptococcus pneumoniae. After overnight incubation, he observed few small colonies (Smooth) and hence he left them in the same incubator for longer period (30-48 hours). The Smooth colonies grew large with uneven contour (Rough) (Griffith, 1928). We lost Dr Griffith in the World War II but his laboratory note book was left behind.

A remarkable coincidence is that the Mitis group pathogens (respiratory) and the dental pathogen S. mutans utilize partially five-carbon sugar-alcohol (XYLITOL) even in the presence six carbon glucose and fructose (Reiner, 1975). After 16 years of Dr. Griffith's death, Avery et al of Rockefeller University (USA) made an attempt to understand these colonies (smooth and rough) but assuming an uptake of DNA but never genes! Their TCA insoluble DNA precipitate are merely the nucleotides never carrying any genes (Reiner, 1975; O'Connor, 2008). These investigators have isolated DNA nucleotides by suspending the pathogens in highly alkaline solution but neutralized by using TCA. The TCA insoluble precipitate is the nucleotide fragments but never bio-macromolecules. Some years later the Nobel Prize winners Watson and Crick discovered the *E. coli* -K12 chromosome as double helix DNA consisting of two strands with A-T/ G-C base pairing but remained silent about the TCA insoluble precipitate of O'Connor (O'Connor, 2008; Watson & Crick, 1953). In fact, I tried to isolate *E.coli* K-12 extra-chromosome by using their isolation procedure but in vain (Kornberg, 1984). In 1960 Nobel Prize winners Dr Arthur Kornberg (USA) and Dr. Severo Ochoa (Spain) shared the Nobel Prize for their contribution in molecular biology. Dr. Arthur Kornberg discovered the DNA polymerase I in studying DNA replication with the tiny single stranded DNA bacteriophage phiX174. This phage delivers its CCC DNA genome into the bacterial host *E.coli* C using its spike on the surface, then the single stranded circular DNA of the phage forms RF DNA being in the host *E. coli* C (Kornberg, 1984; Kornberg). However, DNA polymerase I is used not only in repairing the damaged DNA but also by the phage phiX174 multiplication in *E.coli* C. However, it took him many years to isolate all different types of DNA polymerases required for the DNA replication (Lederberg & Tatum, 1946).

Results

Diseases caused by S. pneumoniae and S. mutans can be prevented by the use of Xylitol. For many years we did not have growth-curve of *S. pneumoniae* and the mortality rate from bacterial pneumoniae was increasing at a very high rate from 1990. Vaccines were developed but has not been effective because of these pathogen's antigenic variation (?).

Six carbon sugar fructose competes with 5 carbon sugar alcohol Xylitol in the treatment of mid-ear infection (otitis media) of children. In 2010 Palchaudhuri et al have developed an alternative therapy with Xylitol (Palchaudhuri, et al., 2010). Gram-negative Escherichia coli K-12 does not have the operon for Xylitol metabolism whereas *Escherichia coli* C has a complete operon for metabolising Xylitol (five carbon sugar alcohol). Xylitol can enter a Pentose Phosphate pathway called Xylitol Gluconeogenesis, to produce Glucose.

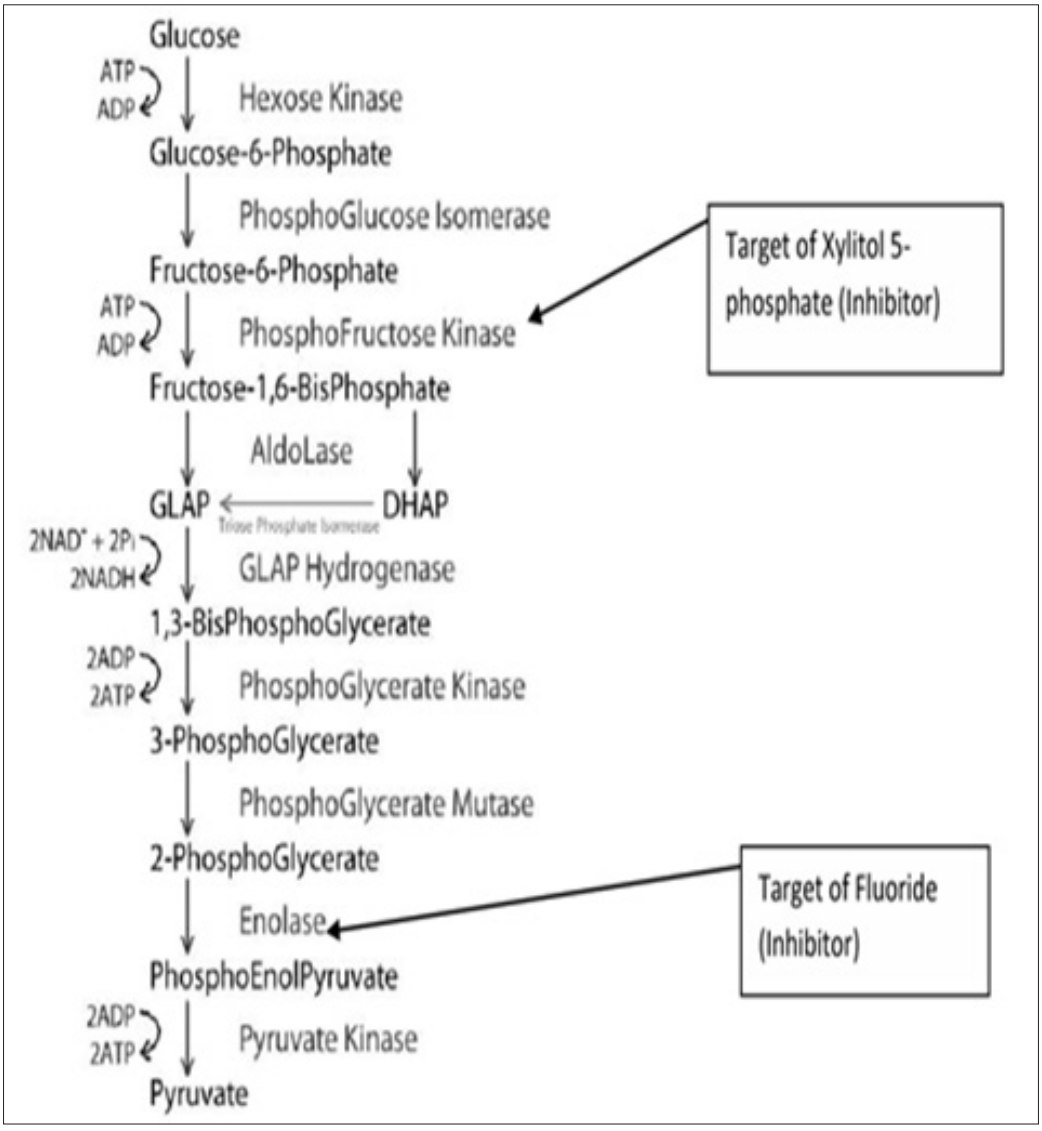
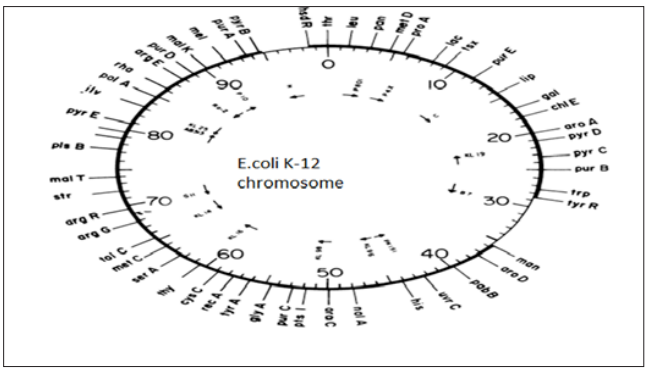


Figure 1: Targets of Xylitol and Fluoride in the Glycolytic pathway.

Discussion

Comparison of two genetic linkage map confirms that the presence of xylitol operon in E.coli C but E.coli K-12 is lacking such xylitol operon. Fig 2 is presented for the comparison of their linkage maps. Except the Xylitol operon the chromosomes don't differ but significantly enough **the two membranes** (outer and inner) of ***E.coli*** C is fused for creating an **adhesion zone** so the delivery of such a phage genome (single stranded CCC DNA of length 5.5Kb) (Bayer, (n.d.)). Takes place by a spike (Palchaudhuri, Ph.D. thesis Kolkata University, 1967). **Is there any bio-signal?**



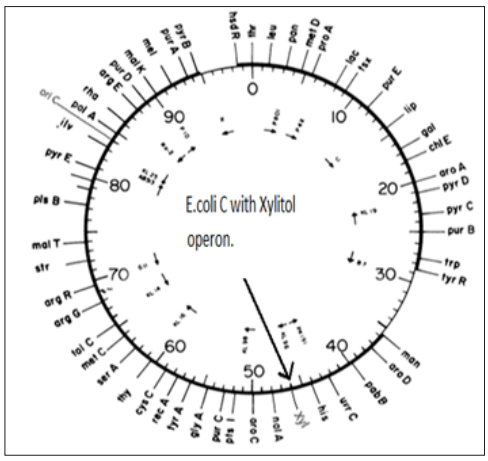


Figure 2: Comparison of Genetic Linkage map of ***E. coli*** K-12 and ***E. coli*** C.

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