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Screening and Analysis of Bacteroides fragilis Genome Sequence for D-Lactate Dehydrogenase Enzyme using Bioinformatic Tools

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Lactate dehydrogenase (LDH) enzyme of Bacteroides fragilis was targeted to perform structure based drug design study. A literature and database search was conducted for the Bacteroides fragilis L-LDH prior to amplification of targeted gene. Even though there was evidence for the L-LDH enzyme in an article and metabolic pathway of Bacteroides fragilis, it was not possible to find the L-LDH enzyme in it's genome. In order to enlighten the presence or absence of any LDH or LDH-like sequences in the genome of Bacteroides fragilis, some of LDH specific motifs and sequences were scanned in the genome of this bacterium using a program developed for this study. These were GXGXXG motif, known as nicotinamide adenine dinucleotide (NAD)-binding motif found in all organism's L-LDH enzyme, NPVD and NPMD sequences, commonly found in L-LDH of most organisms. Possible nucleotide sequences were found for each sequence; 5, 8 and 15 different nucleotide sequences were found in the genome of the Bacteroides fragilis, GXGXXG motif, NPVD and NPMD sequences, respectively. These nucleotide sequences were then searched against the genome of Bacteroides fragilis using the NCBI BLAST for annotation and none of them corresponded to L-LDH protein. This clearly suggests L-LDH being not present in the genome of targeted bacterium. Therefore study was directed on D-LDH enzyme with the aim of conducting structure-based drug design studies.

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