Annotation of the Kytococcus sedentarius Genome from Ksed_09020 to Ksed_09080

Kimberly Van Knapp, Spencer Wrazen, Andrea DiChristopher and Robert O’Connor
Kenmore East High School and the Western New York Genetics in Research Partnership

Abstract
A group of consensuses 3 genes from the microorganism Kykococcus sedentarius (Ksed_09020 – Ksed_09080) were annotated using the collaborative genome annotation website GENI-Act. The Genbank proposed a gene product name for each gene was searched in terms of their general genomic information, amino acid sequence and similarity database searches. The Karsten Becker. Cases of pneumonia have been linked to Kykococcus sedentarius during neutropenia following induction chemotherapy for acute myeloid leukemia (Leweeng Hi, I is the most sensitive to ampicillin, amoxicillin, n. penillin, tetracycline, and vancomycin (D. Chauhdary).

Current study involving the gene annotation process has not been entirely curried as a result of the many sequence comparisons in the databases. Each database revives a search as to what it thinks it is, but what is this? For sure the programs the modules Geni-Act are designed to create an output of information to the individual using it, however, it may often lead to programming mistakes. Individuals currently working on improving this study are trying to discover improved ways to make the programs more accurate in the sense that these databases deliver better and more accurate information overall.

Methods and Materials

Each database in the modules are responsible for discovering more information on the gene being studied. The database range from providing information on location, gene families, what it is, and what the function of it is. Images are also produced in these modules, which provides a visual understanding and help further the comprehension of the information being allocated.

Results

Kytococcus sedentarius 09020:

Aminopeptidase N (APN) is a Zn2+ dependent membrane-bound enzyme that degrades signal proteins and peptides with an N-terminal amino acid. It also an enzyme, related to tumorigenesis, immune system, pain, etc. in humans, this enzyme can serve as a receptor for human viruses like the human coronavirus which is an important cause of upper respiratory tract infections. APN is known to play a role in the growth of different human cancer and is commonly known to be a suitable target for anti-cancer therapy. Defect in this gene appear to be a cause of various types of leukemia or lymphoma. The aminopeptidase N (APN) exists in two forms such as a membrane aminopeptidase N and the soluble aminopeptidase N. Bacteria display several aminopeptidase activities which can be detected in the cytoplasm, on membranes, associated with the cell envelope or secreted into the extracellular media (7). pRABK predicted a cytoplasmic localization for Ksed_09020, as shown in Figure 3 below. No membrane-located helices were detected by TMHMM or Phobius, further supporting the cytoplasmic localization of Ksed_09020. The substrate specificity of the particular aminopeptidase in Kykococcus sedentarius is unknown.

Kytococcus sedentarius 09040:

Ksed_09040 has 462 nucleotides and 153 amino acids in its sequence. Based on what was found using the Geni-Act database, it is a peptide/protein trans-Isomerase enzyme. It catalyzes the trans-isomerization of proline-Imidic peptide bonds in oligopeptides. Its gene product name is a trigger factor which is a ribosomal protein that provides a protective nano environment for the peptidyl tRNA. The helices were present in further investigations through TMHMM and further supporting that by using SignalP. Since the lines on the graph do not cross the top threshold line, it predicts that there is no result found for it to be a trans membrane protein and further concluding it is found in the cytoplasm.

Conclusions

Based on the results found using the databases in Geni-Act, Ksed_09020, Ksed_09040 and Ksed_09080 had their cellular localization found in the cytoplasm. All of the results are fully supported based upon the finding through Geni-Act database. Ksed_09020 was determined to be an aminopeptidase. Ksed_09040 was determined to be a ribo-leu-Isomerase and Ksed_09080 was determined to be peptidyl proline trans-isomerase.

Acknowledgments

Supported by NSF I/TEES. Strategies Award Number 1311902. Special thanks to Dr. Stephen Koury, Dr. Duma Dey-Rao and Dr. Patricia Messa-Webb for their help in completing the work presented.

References

5. www.prosite.ac.uk/psicat/psicat.html
6. www.prosite.ac.uk/psicat/psicat.html

www.buffalo.edu