**KCC FIG – Undergraduate Research as a High Impact Practice**

**Minutes of the Meeting of Wed, 4/28/2021, 12:40pm via Zoom**

Present: Grace Axler-DiPerte (BIO), Craig Hinkley (BIO), Mary Ortiz (BIO),

Jennifer Porcheddu (BIO, College Now)

Meeting began at 12:40pm.

1. Mary welcomed everyone and thanked them for coming.
2. Mary introduced Craig, who shared his knowledge of the NCBI website.
3. Craig shared his knowledge of the NCBI (National Center for Biotechnology Information) website. He showed us how to do searches in general, a DNA search, and a genome search.
   1. On the main page of the website, he pointed out “Popular Resources”. There is a database dropdown menu. This is good for finding research papers. There are 28 databases used in searches. He used PubMed as a demo to research articles on human hemoglobin. Free articles are indicated. Anything in blue print is a link. He searched “nucleotide” to look at genes.
   2. You can get GenBank numbers to search. You can use PMID numbers as well to do searches.
   3. Craig showed us how to use this site to get information, then how to use it, and what it is.
   4. Craig explained the use of FASTA (eliminate numbers before the lines of code before searching/comparing sequences). Discussion of this took place.
   5. The sequences only provide one of the nucleotides in the pair to save space (ex. for G-C, only G is given). Proteins are given by one letter to save space (ex. V for Valine, not Val).
   6. Craig went over Homologene using a search with human hemoglobin.
   7. There are 3D sites for structures of proteins.
   8. Craig showed us BLAST and how to use it to find sequences. He did demos of Descriptions, Alignments and discussed the E Value. If you want students to compare Bacteria to Humans, you can use protein sequences. BLASTP is the protein version of this. Discussion followed.
   9. Grace suggested Jennifer could use SNPs for eye color with her students.
   10. Craig did a protein sequence search for hemoglobin. Can use BLASTP (P = protein) and BLASTN (N = nucleotide). Spaces do not matter. We discussed how we could use this with our students to do searches.
   11. Grace had her students work in groups to do a search where they had to genetically engineer something. They had to work together. This gives the students real world experiences.
   12. In BIO14 Craig had the students do a cytochrome oxidase search with a human, dog, chimpanzee, and Neanderthal. He said he uses a worksheet for the students to do this and asks who are we more related to? This can be used to create a cladogram.
   13. Craig looks for genes in oysters for his research with students.
4. For our next meeting Craig will show us CLUSTA OMEGA on-line and will demo comparing multiple sequences, as these were asked about. He will also demo the FASTA format.
5. Next meeting: Wed, 5/12/2021, 12:40pm via Zoom. Log on info will be sent out. We will continue discussion/bring new ideas.

Meeting adjourned at 1:30pm.

Minutes respectfully submitted by Mary Theresa Ortiz