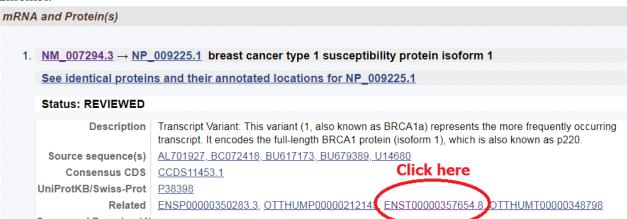Assignment 8: Due 2pm 10/30

At NCBI website, find the gene page for human gene BRCA1 (BRCA1, DNA repair associated). Answer the following questions. You can use other sources like UCSC genome browser, and Ensembl. Most of the information is available at the gene page at NCBI.
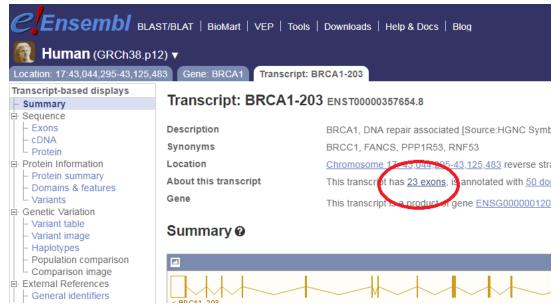
1. Brief description of its function in your own words.
2. What type of tissues express this gene?
3. On what chromosome is this gene located?
4. The exact location of this gene on the genome according to GRCh38.p7 assembly.
5. Names of the 3 genes neighboring this gene on the chromosome.
6. How many papers have been published on this gene?
7. What genetic diseases is associated with mutations of thig gene?
8. What proteins interact with the BRCA1 protein? Name 2 with references.
9. What molecular pathways is the BRCA1 protein part of? Name 2.
10. How many alternatively spliced transcripts (variants) does this gene have?
11. How many protein isoforms does this gene encode?
12. For the transcript called NM_007294.3, how many exons and introns?
13. Retrieve the following sequences for the transcript NM_007294.3. First report their length and then paste the FASTA formatted sequence.
    a. Spanning genomic DNA sequence
    b. mRNA sequence
    c. Corresponding protein sequence
    d. First exon (Hint: easier to find in Ensembl.org, see below)
    e. 5' Untranslated region (UTR)
    f. 3' untranslated region (UTR)
    g. 1000bp promoter sequence upstream of transcription start site(TSS)

Hint: Finding genomic sequences in Ensembl.

1. From the NCBI gene page, find the corresponding transcript ID and click on the direct link to Ensembl.

2. To get the sequences of each exons, click on the 23 exons:

3. We now can see the different types of sequence shown in different colors. Also, variants are highlighted. (see next page)