BIOINFORMATICS ASSIGNMENT 1 (Day 1 - 5)

1. **Gene Name**: TP53 (tumor protein p53)

2. **Function of the Gene**: This gene encodes a tumor suppressor protein containing transcriptional activation, DNA binding, and oligomerization domains. The encoded protein responds to diverse cellular stresses to regulate the expression of target genes, thereby inducing cell cycle arrest, apoptosis, senescence, DNA repair, or changes in metabolism. Mutations in this gene are associated with a variety of human cancers, including hereditary cancers such as Li-Fraumeni syndrome. Alternative splicing of this gene and the use of alternate promoters result in multiple transcript variants and isoforms. Additional isoforms have also been shown to result from the use of alternate translation initiation codons from identical transcript variants (PMIDs: 12032546, 20937277). [provided by RefSeq, Dec 2016]

3. **NCBI accession number**: NC_000017

4. **Forward Primer**: TTGTAATGCAGGGCTGAGGA
5. **Reverse primer**: CTGCTCCCACCTCCTGTTAA

6. **Features of primers:**

	SEQUENCE	TEMPLATE STRAND	START LENGTH	Tm	Gc%
LEFT PRIMER	TTGTAATGCAGGGCTGAGGA	plus	10053	59.01	50
RIGHT PRIMER	CTGCTCCCACCTCCTGTTAA	minus	10260	59.02	55

7.**Amplicon length and sequence**:

Amplicon length:208bp

Amplicon sequence: T
TGTAATGCAGGGCTGAGGAGTGTCCGAAGAGAATGGGCAGGTGAGCGGTGAGAC
AGTTGTTCTTCCAGAAGCTTTGCAGTGAAAGGAATCAAAGAAATGGAGCCGTGT
ATCAGGTGGGGAAGGGTGGGGGCCAAGGGGGTGTCCTTCCCCATACAGAGATTG
CAGGCTGAGAATGACTATATCCTTGTTAACAGGAGGTGGGAGCAG

qPCR Data analysis (DAY 5)

	Ct values	
Housekeeping genes(GAPDH)	Ct 1	Ct 2
Untreated (control)	18.5	18.5
Untreated (control)	17.8	17.8
Untreated (control)	17.5	17.5
Treated	18.3	18.3
Treated	18.5	18.5
Treated	18.2	18.2

	Ct values	
Gene of interest (HER2)	Ct 1	Ct 1
Untreated(control)	23.3	22.5
Untreated(control)	22.5	22.2
Untreated(control)	21.2	21.9
Treated	25.3	25.3
Treated	26.5	26.5
Treated	27.5	27.5

The following data are results of qPCR from cancer cell lines. HER2 stands for human epidermal growth factor. It's healthy in normal amounts, but too much may be a sign of a certain type of breast cancer. Calculate the 2 Delta Ct values for the following data and plot the values on a graph using graphpad prism.

Ans:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1		HouseKepping Gene			Gene Of Intrest			Avg ct value for HG	Avg ct value for GOI	Δct Value	ΔΔct Value	fold change		
2		R1	R2		R1	R2								
3	control(untreated)	18.5	18.5		23.3	22.5		18.5	22.9	4.4		1		
4	sample 1	18.3	18.3		25.3	25.3		18.3	25.3	7	2.6	0.16493849		
5	sample 2	18.5	18.5		26.5	26.5		18.5	26.5	8	3.6	0.08246924		
6	sample 3	18.2	18.2		27.5	27.5		18.2	27.5	9.3	4.9	0.03349292		
7														