BIOINFORMATICS ASSIGNMENT 1 (Day 1 - 5)

Note: You will be added in a slack community of Bversity for further doubts and communications

1. Gene Name: Human glucose regulated protein (GRP-78)

2. Function of the Gene: Translocation of newly synthesized peptides across endoplasmic reticulum membrane, folding and assembly of proteins, targeting misfolded proteins for ER-associated degradation.

3. NCBI accession number: M19645

4. Forward Primer: ACTGCTGTTTTCAGATGGAGGT

5. Reverse primer: CTAGGAGCCAGCTCAGATGC

6. Features of primers: length: forward primer = 22

Reverse primer = 20

Tm: forward primer = 59.89

Reverse primer = 59.97

GC%: forward primer = 45.45

Reverse primer = 60.00

7. Amplicon length and sequence: 345

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>M19645.1:3961-4305 Human 78 kdalton glucose-regulated protein (GRP78)
gene, complete cds
ACTGCTGTTTTCAGATGGAGGTCTTAATTTGAATAATGTTGATATTAGATATTTAGCATTCTTTTTTTTT
TTTTTTTAATGGAGTCTTGCTCTGTCGCCTAGGCTGGGGTGCAGTGGCATGACTTGCAACCTCTGCCTCC
CGAATAGCTGGGATTACAGGTGCCCACCATCACGCCCGGCTAAGTTTTGTATTTTTAGTAGAGGCGAGTT
TCGCCATGTTGGCCAGGCTGGTCTTGAACCCCTAACCTCAGTGATCCCACGGTCACCGACCTGGCCTCCC
AAAAGTACTGTACCCAGCCAATGATTAGCATTCTCACTAATAATAGCATCTGAGCTGGCTCCTAG
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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.

A	B	C	D	E	F	G	H	I	J	K
	HOUSEKEEPING GENE		GENE OF INTEREST		Average ct value for HG	Average ct value for GOI	ΔCt value	ΔΔCt value	Fold change	
CONTROL(untreated)	18.5	18.5	23.3	23.5	18.5	23.4	4.9	0	1	
SAMPLE 1	18.3	18.3	25.3	25.3	18.3	25.3	7	2.1	0.233258248	
SAMPLE 2	18.5	18.5	26.5	26.5	18.5	26.5	8	3.1	0.116629124	
SAMPLE 3	18.2	18.2	27.5	27.5	18.2	27.5	9.3	4.4	0.047366143	