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: FMR1

2. Function of the Gene: Codes for Fragile X Mental retardation protein. It plays a role in the development of synapses. It may be involved in mRNA trafficking from the nucleus to the cytoplasm. The expansion of CGG repeats to 55-230 repeats is the cause of fragile X syndrome. It may also cause Premature ovarian failure.

3. NCBI accession number: >NC_000023

4. Forward Primer: GCTCCTGTCCTCTAAGTCGTTA

5. Reverse primer: GTCTCTTGTGGGTCATGGATTG

6. Features of primers:

Primer size: min: 20 opt: 22 max: 25

Primer Tm: min: 56 opt: 59 max: 63

Primer GC%: min: 40 opt: 50 max: 70

7. Amplicon length and sequence: 169.

GCTCCTGTCCTCTAAGTCGTTAACCCCTTCAGGCATAATGAATTTATTATA

GTAATTCTTTATTAATGATCAATTATTGTAATGGGAGTGGGAGGGCAGGTTGTGGACCAA

ACATCAGGCAAGCATGTATCTGCCTTCAGCTAGATCCAATCCATGACCCACAAGAGAC

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
1		Ct values			Ct values		Average Ct values for HG	Average Ct values for GOI	Δ Ct value	ΔΔCt value	Fold change
2	Housekeeping genes (GAPDH)	Ct 1	Ct 2	Gene of interest (HER2)	Ct 1	Ct 2					
3	Untreated (control)	18.5	18.5	Untreated (control)	23.3	22.5	18.5	22.9	4.4	0	1
4	Untreated (control)	17.8	17.8	Untreated (control)	22.5	22.2	17.8	22.35	4.55	0	1
5	Untreated (control)	17.5	17.5	Untreated (control)	21.2	21.9	17.5	21.55	4.05	0	1
6	Treated	18.3	18.3	Treated	25.3	25.3	18.3	25.3	7	2.6	0.16493849
7	Treated	18.5	18.5	Treated	26.5	26.5	18.5	26.5	8	3.45	0.09150536
8	Treated	18.2	18.2	Treated	27.5	27.5	18.2	27.5	9.3	5.25	0.02627801