BIOINFORMATICS ASSIGNMENT 1 (Day 1 - 5)

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

ROHINI KANBARKAR

1. **Gene Name:** VEGFA (vascular endothelial growth factor A)

2. **Function of the Gene:** It encodes a heparin-binding protein. This growth factor induces proliferation and migration of vascular endothelial cells, and is essential for both physiological and pathological angiogenesis. Disruption of this gene in mice resulted in abnormal embryonic blood vessel formation. Elevated levels of this protein are found in patients with POEMS syndrome. The levels of VEGF are increased during infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

3. **NCBI accession number:** >NC_000006.12

4. **Forward Primer:** TCGTTTAGGATGGGGCACTT

5. **Reverse primer:** ATGTCAGGAGAATGGGCACA

6. **Features of primers:**

- Length of primers : 20 bases
- GC content of primers: 50%
- Tm of Forward primer: 59.01
- Tm of Reverse primer: 59.01

7. **Amplicon length and sequence:**

- Amplicon length : 170bp
- Amplicon sequence :
  TCGTTTAGGATGGGGCACTTATGTCAGGAGAATGGGCACATCGTTTAGGA
  TGGGGCACTTTTGCCTACACACTGAAGGAGCTGTAGCATCCAAGAATACT
  AGATACCTTTAATCCTCCACCAGTCATGGTGACAACCCCAAGCAGCCCAC
  ACATTTTCAAGTGCCCCCAGGATGCGTGGAGGGAGGGGTCTGTGCCCATT
  CTCCTGACAT

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.

- **CALCULATED VALUES:**

	HOUSEKEEPING GENE (GAPDH)		GENE OF INTEREST (HER2)		average ct value for HG	average ct value for GOI	Δct value	ΔΔct value	fold change
	R1	R2	R1	R2					
Control (untreated)	18.5	18.5	23.3	22.5	18.5	22.9	4.4	0	1
sample 1	18.3	18.3	25.3	25.3	18.3	25.3	7	2.6	0.164938
sample 2	18.5	18.5	26.5	26.5	18.5	26.5	8	3.6	0.082469
sample 3	18.2	18.2	27.5	27.5	18.2	27.5	9.3	4.9	0.033493