Logo, company name

Description automatically generated**COMSATS University Islamabad**

**Sahiwal Campus**

**(Department of Biosciences)**

**LAB Assignment 1# (10 marks)**

**Name: Aamna Zahid  
Roll #: Fa20-Bcs-151**

**Section: C**

**Q:1:**

**Gene Name**: keratin 18 [Homo sapiens (human)] **Odd Roll number**

**Gene Name:** keratin 75 [Homo sapiens (human)] **Even Roll Numbers**

1. **Describe the official name and symbol**

**Name:**Keratin, type I cytoskeletal 18

**Symbol:**KRT18

1. **Download its FASTA Sequence and complete dataset**

**FASTA Sequence:**

>sp|P05783|K1C18\_HUMAN Keratin, type I cytoskeletal 18 OS=Homo sapiens OX=9606 GN=KRT18 PE=1 SV=2 MSFTTRSTFSTNYRSLGSVQAPSYGARPVSSAASVYAGAGGSGSRISVSRSTSFRGGMGS GGLATGIAGGLAGMGGIQNEKETMQSLNDRLASYLDRVRSLETENRRLESKIREHLEKKG PQVRDWSHYFKIIEDLRAQIFANTVDNARIVLQIDNARLAADDFRVKYETELAMRQSVEN DIHGLRKVIDDTNITRLQLETEIEALKEELLFMKKNHEEEVKGLQAQIASSGLTVEVDAP KSQDLAKIMADIRAQYDELARKNREELDKYWSQQIEESTTVVTTQSAEVGAAETTLTELR RTVQSLEIDLDSMRNLKASLENSLREVEARYALQMEQLNGILLHLESELAQTRAEGQRQA QEYEALLNIKVKLEAEIATYRRLLEDGEDFNLGDALDSSNSMQTIQKTTTRRIVDGKVVS ETNDTKVLRH

1. **Explain gene type**

Protein coding gene

1. **Describe its lineage and aliases**

**Lineage:** Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Actinopterygii; Neopterygii; Teleostei; Ostariophysi; Cypriniformes; Cyprinidae; Cyprininae; Carassius

**Aliases:** K18; CK-18; krt18; keratin; Keratin-18

1. **Summaries its function and expression in your own words**

**Function:** It involved in the uptake of thrombin-antithrombin complexes by hepatic cells (By similarity). When phosphorylated,it play a role in filament reorganization. Involved in the delivery of mutated CFTR to the plasma membrane.

**Expression:** Expressed in colon, placenta, liver and very weakly in exocervix. Increased expression observed in lymph nodes of breast carcinoma.

1. **Describe the location of gene in chromosome**

**Location:** chromosome: Un LOC113092494

1. **Name any 10 interacting genes**

PLEC isoform 1C, thrombin-antithrombin complex, PNN and mutated CFTR hepatitis C virus/HCV core protein EPPK1 PKP1 and PKP2.

1. **Give its protein information**

Keratin 18 is a type I cytokeratin. It forms intermediate filaments, which are structural components of epithelial cells [Wikipedia keratin]. These filaments provide strength and support to the cells. Keratin 18 specifically partners with Keratin 8 (K8) to create these intermediate filaments.

1. **Provide information of its reference sequences its RNA and Protein information**

**Reference Sequence:**

**>**MNIRTLQTVCTGIGGVCSSRTTSSRLTSAVSCSSRILGKVTMTRVLGGRSGYMTTASSSLNVAYSSSRSSGAGGGGFGNQSLTGGASSTASYSSSSSTSQSAGASRGYSFSGGGVGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGGGYGG

**RNA information:**

The RNA information for the Keratin, type I cytoskeletal 18 (KRT18) gene includes its full nucleotide sequence, which consists of exons and introns. Exons are the coding regions that are transcribed into mRNA and translated into protein, while introns are non-coding regions that are removed during RNA processing. The mRNA transcript of KRT18 undergoes splicing to remove introns and create a mature mRNA molecule that can be translated into the KRT18 protein. Additionally, the KRT18 gene contains regulatory elements such as promoters and enhancers that control its expression and regulation in cells.

**Q:2:**

1. **Protein name of your corresponding gene and its annotation status and score**

**Gene:** KRT18

**Annotation Status:** Complete

**Annotation Score:** 5/5

1. **Information regarding its name and taxonomy**

The protein is named Keratin, type I cytoskeletal 18 (KRT18) and belongs to the taxonomic group of mammals, specifically Homo sapiens.

1. **Involvement of protein in different diseases**

KRT18 is involved in various diseases, including liver diseases such as cirrhosis and hepatocellular carcinoma. It is also associated with breast cancer, where it can serve as a biomarker for tumor progression and prognosis.

1. **Details about its binary interactions**

KRT18 has several binary interactions with other proteins. For example, it interacts with the protein Plectin, forming a complex that plays a role in maintaining cell structure and integrity. It also interacts with proteins such as Filamin A and Annexin A2, contributing to cellular functions such as cytoskeletal organization and vesicle trafficking.

1. **Its structural information**

The structural information of KRT18 includes its primary structure, which consists of a chain of amino acids encoded by the KRT18 gene. It also has a secondary structure characterized by alpha-helices and beta-sheets, contributing to its overall three-dimensional conformation.

1. **Domains and their description**

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1. **Download its protein sequence**