1. <HSP>.....<G4> …….<virusRNA> graph

Source: https://www.frontiersin.org/articles/10.3389/fimmu.2022.947789/full#:~:text=HSPs%20inhibit%20viral%20infection%20by,viruses%20to%20silence%20their%20replication.
HSPs can also promote translation by binding to the viral genome. HSC70 can favor virus replication by binding regulator non-coding RNA (ncRNA). Studies have reported that many viruses, such as human immunodeficiency virus (HIV) (73), DENV (74), and West Nile virus (WNV) (75), encode microRNA-like ncRNA to regulate virus replication. Similarly, rabies virus (RABV) transcribes a small ncRNA, called leader RNA (leRNA). It was also found that HSC70 binds to leRNA to regulate viral replication during infection. Hepatitis C virus (HCV) is currently causing a worldwide epidemic. The nonstructural (NS) proteins are responsible for replication of HCV RNA as well as viral particle assembly, and are primary antiviral targets (76). In a recent study, Li et al. found that HSC70 co-precipitates with HCV NS proteins and RNA, interacting with the HCV replication complex and participating in HCV replication by regulating RNA translation from the HCV genome (77).
Modified text: Heat Shock Proteins include HSC70. NoncodingRNA has name ncRNA. HSC79 binds ncRNA. HumanImmunodeficiencyVirus has name HIV-1 . HIV-1 encodes ncRNA. ncRNA regulate replication. Replication manifests infection.
Original Text: HIV-1 is an RNA virus in the Lentivirus genus and is part of the Retroviridae family. Lentiviruses are single-stranded, positive-sense, enveloped RNA viruses. HIV-1 particles contain two molecules of genomic RNA that are converted into double-stranded DNA by the viral reverse transcriptase (RT). The resulting viral DNA is then imported into the nucleus and insertion into the cellular DNA is catalyzed by the virally encoded integrase (IN). Once integrated, transcription from the viral promoter at the 5′ long terminal repeat generates mRNAs that code various viral proteins and genomic RNA. Alternatively, the provirus may become latent, which allows the virus and its host cell to avoid detection by the immune system. The presence of G4 structures has been highlighted at both RNA and DNA levels with implications throughout the viral life cycle. Retroviral RNAs dimerize in the cytoplasm of an infected cell allowing two copies of the genome to be encapsidated in the newly produced virion (97). While a single copy of the genome is sufficient for viral replication, the second copy is also used during reverse transcription, and the viral RT switches multiple times between the two RNA molecules (98,99). The strand transfers

are partially responsible for the viral variability through production of recombinant molecules. Therefore, understanding the mechanisms that drive dimerization and recombination is essential.

Dimerization is a two-step process that involves sequences upstream of the splice donor site (100,101). The sequences involved in initial dimerization and encapsidation partially overlap at the 5′ end of the viral genome. One of the sequences is a highly conserved dimer initiation site (DIS) that forms a stem loop. A concentration-dependent kissing–loop interaction is initiated from contacts between consecutive guanines (102); the interaction then spreads to the stems. However, this interaction does not seem sufficiently strong to keep the two copies together during reverse transcription.

Modified text:

HIV-1 is an RNA virus.
HIV-1 has genus Lentivirus.
Lentivirus genus is in Retroviridae family.

Lentiviruses are single-stranded virus.
Lentiviruses are positive-sense viruses.
Lentiviruses are enveloped viruses.
Lentiviruses are RNA virus.

HIV-1 contains two molecules of RNA.
RNA becomes DNA via reverse transcriptase.

Viral reverse transcriptase produces HIV-1 DNA.
HIV-1 DNA is imported into the host-cell nucleus.
HIV-1 DNA transcription is located at five-prime end.
Five-prime end is in the DNA.
Five-prime end is in the RNA.
RNA is located in the host cell.
DNA is located in the host cell.
Cell is in human.
Human is host.

HIV-1 DNA in host is an infected human.

RDF: Annotation HSP virusRNA 1

2. <HSP>...<host> graph

Source: https://link.springer.com/article/10.1007/s12192-021-01223-3

Original Text:
Small HSP (sHSP) are a group of ten (HSPB1-10) proteins having a molecular weight from 15 to 30 kDa, which are normally present as large oligomers at basal levels. They were first discovered in the chromosomal puffs of *Drosophila melanogaster* upon heat shock and ecdysterone treatment (Tissiéres et al. 1974). The members of this family have a conserved C-terminal domain, homologous to alpha crystallin of the vertebrate eye lens (Kim et al. 1998). The length of the C-terminus is highly flexible and has a conserved sequence, a IXI/V motif. The N-terminus domain, also called the WDPF domain (as it contains this amino acid sequence), is highly variable (Lelj-Garolla and Mauk 2006) (Fig. 2a). There are two alpha crystallin genes, alpha A and alpha B. These proteins are a major component of the vertebrate eye lens. In the early 1990s, it was discovered that alpha B crystallin is a small heat shock protein (Klemenz et al. 1991). Alpha A crystallin confers thermo-resistance to cells upon overexpression (van den Ijssel et al. 1994) and also acts as a molecular chaperone outside of its role as a major lens protein (Horwitz 1992). HSP27 is one of the most studied members of the sHSP family. The protein is phosphorylated by p38 MAPK in vivo at multiple serine residues (Gaestel et al. 1991; Landry et al. 1992; Guay et al. 1997). It then forms smaller oligomers (Mehlen et al. 1997; Rogalla et al. 1999), and the phosphorylated form regulates many of its functions. HSP27 has been documented to respond to different types of cellular stress. During oxidative stress, it acts as an antioxidant by lowering reactive oxygen species by decreasing iron levels (Mehlen et al. 1997; Arrigo 2001; Arrigo et al. 2005). During chemical stress, HSP27 acts as an anti-apoptotic agent. It binds DAXX during Fas-FasL-mediated apoptosis (Charette and Landry 2000) and prevents mitochondria-dependent apoptosis by interacting with cytochrome c and indirectly inhibiting Bax (Bruey et al. 2000; Havasi et al. 2008). It has been observed that the levels of HSP27 significantly increase in many disease states such as renal injury, renal fibrosis, cancer, cardiovascular disease, neurodegenerative disease, and neuronal injury (Vidyasagar et al. 2012).

HSP27 has been implicated in viral infections also. In human adenovirus–infected cells, HSP27, p38 MAPK and NFκB-p65 form a signalling complex that affects downstream pro-inflammatory mediators (Rajaiya et al. 2012). HSP27 cellular localization is modified and reorganized during HSV-1 infection, and furthermore, replication of the virus is drastically reduced upon depletion of the HSP27 (Mathew et al. 2009). The same is the case in Enterovirus (EV-A71) infection where HSP27 was increased upon infection whereas knockout of HSP27 results in reduced viral replication (Dan et al. 2019). The converse of what happens in other viruses occurs in swine fever virus wherein depletion of HSP27 increases virus replication. Ectopic expression reduces replication through activation of NF-κB signalling in PK-15 cells. HSP27 was also shown to interact with NS5A, a non-structural protein, as a response to viral replication and assembly (Ling et al. 2018). In hepatitis B virus, HSP27 levels are increased in infected human liver tissues and virus-producing HepG2.2.15 cells (Tong et al. 2013).

The studies on HSP27 in different viruses indicate its role as both a pro-viral and antiviral factor through various mechanisms involving different signalling pathways.

On the other hand, work done on the role of sHSPs or even HSP27 in HIV-1 infection is quite limited. In an early study, it was shown that in HIV-1 chronically infected monocytic and lymphocytic CD4+ T-cell lines, there is a 2- to 15-fold increase in HSP27 production (Brenner et al. 1995). They also showed that there is an early increase in HSP27 mRNA and protein, which is short-lived and declines during initiation of de novo viral synthesis. The levels again rise in the late stages of infection when there is maximal viral production and CD4 cytolysis (Wainberg et al. 1997). In 2007, Liang et al. investigated cellular proteins that can suppress the viral protein R (Vpr) function of HIV-1. Increased levels of HSP27 inhibit Vpr-induced cell cycle G2 arrest (Liang et al. 2007), and activation of HSP27 by Vpr is mediated through HSF1. HSP27 seems to suppress Vpr activities, and Vpr in turn inhibits a prolonged expression of HSP27 in heat shocked cells. The role of HSP27 in other virus infections through NF-κB has been highlighted earlier, and NF-κB is also central to the functions of HIV-1 Vpr during the virus life cycle (Varin et al. 2005; Kogan et al. 2013). However, the link between HSP27, NF-κB and Vpr, if any, has not yet been well explored and may be worth looking into. CD8+ CD57+ lymphocytes, a population that expands during HIV infection and other chronic conditions, show a constitutive expression of HSP27 (Wood et al. 2010). Low HSP27 levels coincided with increased apoptosis of the cells and vice versa. Apart from showing the early induction of HSP27 during HIV-1 infection, Brenner and Wainberg also indicated the role of HSP27 and HSP70 as vaccine adjuvants due to their ability to interact with viral proteins and also redistribute themselves to the surface of the plasma membrane (Brenner and Wainberg 1999). In 2017, Milani et al. further added to this body of work, by illustrating the use of HSP27-Nef fusion DNA or protein to elicit high humoral and cellular immune responses (Milani et al. 2017, 2020). Further exploration in this area could help the HIV-AIDS community in developing a vaccine.

The literature on the role of alpha crystallins (HSPB4 and HSPB5) on HIV pathogenesis is very limited. One study reported that alpha crystallins bound to calcium ions assist in the folding of HIV-1 protease through a molten-globule-like intermediate (Dash et al. 2005). Another isoform of the sHSP family, HSPB8 regulates Sam68, a protein that enhances Rev response element–mediated gene expression and viral production. HSPB8 actually inhibits the function of Sam68 in this pathway through its binding with Sam68 (Badri et al. 2006). Further studies in elucidating the role of these sHSP isoforms in virus infection could be very useful.

Modified Text:
Small HSP have name sHSP
sHSP have ten HSPB1-10
HSPB1-10 are proteins.
HSPB1-10 have molecular weight of minimum 15 kDA.
HSPB1-10 have molecular weight of maximum 30 kDa.
HSPB1-10 have a conserved C-terminal domain.
C-terminus domain is flexible.
C-terminus domain has IXI/V motif.
N-terminus domain has name WDPF domain.

WDPF domain has amino acid sequence.
Amino acid sequence is variable.
Amino acid sequence of WDPF domain has alpha A crystallin genes
Amino acid sequence of WDPF domain has alpha B crystallin genes.
Alpha B crystallin genes are in vertebrate eye lens.

Alpha B crystallin is a small HSP.
Alpha A crystallin confers thermo-resistance to host cells.
Alpha A crystallin is a molecular chaperone.
Alpha A crystallin is a major lens protein.

Heat Shock Protein 27 has name HSP27.
HSP27 is a small HSP.
HSP27 is phosphorylated by p38 MAPK.
p38 MAPK is located in serine residues.
HSP27 forms smaller oligomers.
HSP27 regulates cellular stress.
HSP27 regulates oxidative stress.
HSP27 acts as an antioxidant.
Antioxidants lower reactive oxygen species.
HSP27 lowers iron levels.
HSP27 acts as an anti-apoptotic agent.
HSP27 binds DAXX.
DAXX is in Fas-FasL-mediated apoptosis.
DAXX is in mitochondria-dependent apoptosis.
HSP27 interacts with cytochrome c.
HSP27 inhibits Bax.
HSP27 increases in HIV-1.
HIV-1 causes infection.
Infection is located in cell.
Cell is T-cell
T-cell is lymphocytic.
T-cell makes CD4+.
Cell is located in host.
Host is human.
Infection is disease.

HSP27 is produced by cell.
HSP27 is produced by mRNA.
mRNA has name messenger RNA.
mRNA declines during HIV-1 synthesis.
HSP27 increases during cytolysis.
Cytolysis depends on CD4.
HSP27 inhibit Vpr-induced cell cycle.
Vpr has name viral protein R.
Vpr is produced by HIV-1.

Vpr activates HSP27.
Vpr is mediated by HSF1.
HSP27 suppresses Vpr.
Vpr inhibits HSP27.
HSP27 is involved with NF-κB .
NF-κB is in host cell.
Vpr needs NF-κB.
NF-κB is used by HIV-1.
NF-κB is used in virus life cycle.

CD8+ is a lymphocyte.
A lymphocyte is a host cell.
CD57+ is a lymphocyte.
CD8+ expands during HIV infection.
CD57+ expands during HIV infection.

HSP27 prevents apoptosis.
Apoptosis is a state.
States are of cells.
HSP27 is induced during HIV-1 infection.

HSP27 is a vaccine adjuvant.

HSP70 is a vaccine adjuvant.
HSP27 interacts with viral proteins.
HSP70 interacts with viral proteins.
HSP27 is on surface of plasma membrane.
HSP70 is on surface of plasma membrane.

HSP27 fuses with NefDNA.
HSP27-NefDNA make high humoral immune response.
HSP27-NefDNA make high cellular immune response.

HSPB4 is a alpha crystallin.
HSPB5 is a alpha crystallins.
Alpha crystallins bind to calcium ions.
Calcium ions fold HIV-1 protease.
HSPB8 is a small HSP.
HSPB8 regulates Sam68.
Sam68 is a protein.
Sam68 enhances Rev response element–mediated gene expression.
Sam68 enhances Rev response element–mediated viral production.

HSPB8 inhibits Sam68.
HSPB8 binds with Sam68.

RDF:Annotation HSP host 2

3. <host>...<human> graph

Source: https://www.cancer.gov/publications/dictionaries/cancer-terms/def/cell
Original text: A cell has three main parts: the cell membrane, the nucleus, and the cytoplasm. The cell membrane surrounds the cell and controls the substances that go into and out of the cell. The nucleus is a structure inside the cell that contains the nucleolus and most of the cell's DNA. It is also where most RNA is made.
Modified text: Cell has parts. Membrane is a part of a cell. Nucleus is a part of a cell. Cytoplasm is part of a cell. Nucleolus is located in nucleus. DNA is located in nucleolus. RNA is made in nucleolus.
RDF: Annotation host human 3

4. <virusRNA>...<Disease> graph

Source: *none*
Modified text: HIV-1 causes HIV. HIV has name human immunodeficiency virus. HIV-1 is a virus. HIV is a disease. HIV-1 is an RNA virus.
RDF: Annotation virusRNA Disease 4

5 <virusRNA>...<G4> graph Source: Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4227801/
Original Text: Conversely, a G-quadruplex or G4 is formed by nucleic acid sequences (DNA or RNA)

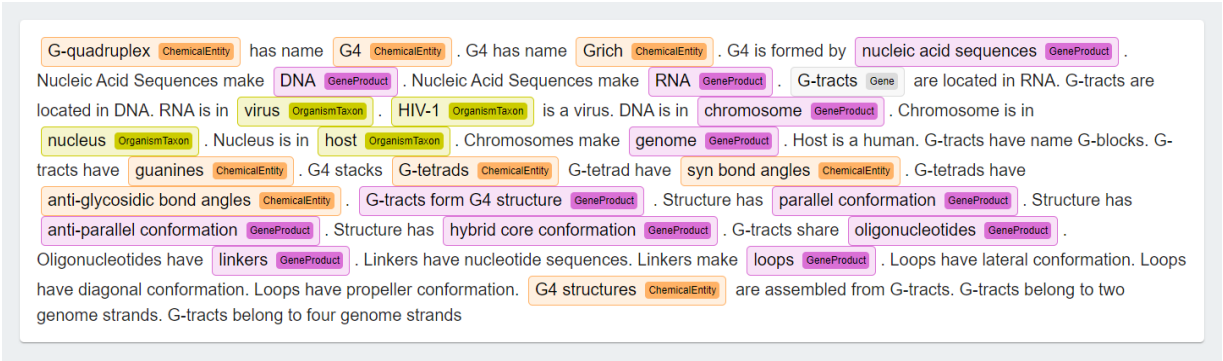
containing G-tracts or G-blocks (adjacent runs of guanines) and composed of various numbers of guanines. Depending on the nucleotide sequence, the way G4s can be formed presents a high degree of diversity. The core of a G4 is based on stacking between two or more G-tetrads, wherein the guanines can adopt either a syn or an anti glycosidic bond angle conformation. Consequently, each of the four G-tracts that form the core of the structure can run in the same or opposite direction with respect to its two neighbors, forming parallel, anti-parallel or hybrid core conformations. Depending on these orientations, the G-blocks delimit four negatively charged grooves of different sizes: narrow, medium or wide (Figure 1b–e). For intra-molecular structures (Figure (Figure1b1b and andc),c), the four G-tracts belong to the same oligonucleotide and are attached by linkers with variable nucleotide sequences and lengths. These loops can adopt three different conformations: lateral, diagonal or propeller (Figure 1b–d). The bi- or tetra-molecular G4 structures (Figure (Figure1d-e)1d-e) are assembled from G-tracts belonging to two or four different strands.

Modified text:
G-quadruplex has name G4.
G4 has name Grich.
G4 is formed by nucleic acid sequences.
Nucleic Acid Sequences make DNA.
Nucleic Acid Sequences make RNA.
G-tracts are located in RNA.
G-tracts are located in DNA.
RNA is in virus.
HIV-1 is a virus.
DNA is in chromosome.
Chromosome is in nucleus.
Nucleus is in host.
Chromosomes make genome.
Host is a human.

G-tracts have name G-blocks.
G-tracts have guanines.

G4 stacks G-tetrads
G-tetrad have syn bond angles.
G-tetrads have anti-glycosidic bond angles.
G-tracts form G4 structure .
Structure has parallel conformation.
Structure has anti-parallel conformation.
Structure has hybrid core conformation.

G-tracts share oligonucleotides.
Oligonucleotides have linkers.
Linkers have nucleotide sequences.
Linkers make loops.
Loops have lateral conformation.
Loops have diagonal conformation.
Loops have propeller conformation.
G4 structures are assembled from G-tracts.
G-tracts belong to two genome strands.
G-tracts belong to four genome strands.



RDF file: Annotation 5 Virus-G4

6. <HSP>...<G4> …<Host> graph

Source: https://link.springer.com/article/10.1007/s12192-021-01223-3

Original Text:

See Table 1. https://link.springer.com/article/10.1007/s12192-021-01223-3/tables/1

Modified Text:
HSPB6 has names PPP1R91, FLJ32389, and HSP20.
HSPB6 is located in Intracellular.
Intracellular is located in Cell.
Cell is located in Host.
Host is located in Human.

HSPB6 subcellular location is Cytosol and additionally in nucleoli, Golgi apparatus.
HSPB6 has length 160 aa.
HSPB6 has mass 17 kDA.
HSPB7 has names CvHSP.
HSPB7 is located in Intracellular.
HSPB7 subcellular location is Nucleoplasm. HSPB7 has length 170 aa.
HSPB7 has mass 19 kDA.
HSPB8 has names CRYAC, E2IG1, HSP22, PP1629, and CMT2L.
HSPB8 is located in Intracellular.
HSPB8 subcellular location is Cytosol and additionally in nucleoplasm, nuclear bodies.
HSPB8 has length 196 aa.
HSPB8 has mass 22 kDA.
HSPB9 has names CT51.
HSPB9 is located in Intracellular.
HSPB9 subcellular location is in cell.
HSPB9 has length 159 aa.
HSPB9 has mass 17 kDA.
HSPB10 has names ODF1, CT133, ODF27, ODFPG, and ODFP.
HSPB10 is located in Intracellular.
HSPB10 subcellular location is in cell.

HSPB10 has length 250 aa. HSPB10 has mass 28 kDA.
HSPB11 has names IFT25, PP25, C1orf41, and HSPCO34. HSPB11 is located in Intracellular. HSPB11 subcellular location is Nucleoplasm and additionally in cytosol. HSPB11 has length 144 aa. HSPB11 has mass 16 kDA.
HSP40/DNAJ has names . HSP40/DNAJ is located in . HSP40/DNAJ subcellular location is . HSP40/DNAJ has length aa. HSP40/DNAJ has mass kDA.
DNAJA1 has names dj-2, hdj-2, HSJ2, HSPF4, NEDD7. DNAJA1 is located in Intracellular. DNAJA1 subcellular location is Cytosol and additionally in microtubules. DNAJA1 has length 397 aa. DNAJA1 has mass 44.9 kDA.
DNAJA2 has names CPR3, DNAJ, DNJ3, HIRIP4. DNAJA2 is located in Intracellular. DNAJA2 subcellular location is Nucleoli, cytosol and additionally in intermediate filaments. DNAJA2 has length 412 aa. DNAJA2 has mass 45.7 kDA.
DNAJA3 has names hTid-1, TID1. DNAJA3 is located in Intracellular. DNAJA3 subcellular location is Mitochondria and additionally in vesicles. DNAJA3 has length 480 aa. DNAJA3 has mass 52.5 kDA.
DNAJA4 has names PRO1472. DNAJA4 is located in Intracellular. DNAJA4 subcellular location is Plasma membrane, cytosol. DNAJA4 has length 397 aa. DNAJA4 has mass 44.8 kDA.
DNAJB1 has names Hsp40, HSPF1, RSPH16B, Sis1,Hdj1. DNAJB1 is located in

Intracellular. DNAJB1 subcellular location is Nucleoplasm. DNAJB1 has length 340 aa. DNAJB1 has mass 38 kDA.
DNAJB2 has names CMT2T, HSJ1, HSPF3. DNAJB2 is located in Intracellular. DNAJB2 subcellular location is Nuclear membrane. DNAJB2 has length 324 aa. DNAJB2 has mass 35.6 kDA.
DNAJB3 has names HCG3. DNAJB3 is located in in cell.. DNAJB3 subcellular location is in cell.. DNAJB3 has length 145 aa. DNAJB3 has mass 15.6 kDA.
DNAJB4 has names HLJ1. DNAJB4 is located in Intracellular. DNAJB4 subcellular location is Nucleoplasm and additionally in plasma membrane, cytosol. DNAJB4 has length 337 aa. DNAJB4 has mass 37.8 kDA.
DNAJB5 has names Hsc40. DNAJB5 is located in Intracellular. DNAJB5 subcellular location is Nucleoplasm and additionally in cytosol. DNAJB5 has length 348 aa. DNAJB5 has mass 39.1 kDA.
DNAJB6 has names LGMD1D, MRJ. DNAJB6 is located in Intracellular. DNAJB6 subcellular location is Nucleoplasm and additionally in cytosol. DNAJB6 has length 326 aa. DNAJB6 has mass 36.1 kDA.
DNAJB7 has names HSC3. DNAJB7 is located in Intracellular. DNAJB7 subcellular location is in cell.. DNAJB7 has length 309 aa. DNAJB7 has mass 35.4 kDA.
DNAJB8 has names CT156, MGC33884. DNAJB8 is located in Intracellular. DNAJB8 subcellular location is Cytosol and nucleus. DNAJB8 has length 232 aa. DNAJB8 has mass 25.7 kDA.
DNAJB9 has names MDG1. DNAJB9 is located in Intracellular. DNAJB9 subcellular location is Endoplasmic reticulum, cytosol. DNAJB9 has length 223 aa. DNAJB9 has mass 25.5 kDA.
DNAJB11 has names EDJ, ERdj3, HEDJ. DNAJB11 is located in Intracellular. DNAJB11 subcellular location is Endoplasmic reticulum. DNAJB11 has length 358 aa. DNAJB11 has mass 40.5 kDA.
DNAJB12 has names DJ10, FLJ20027. DNAJB12 is located in Membrane. DNAJB12 subcellular location is Endoplasmic reticulum and additionally in nuclear membrane. DNAJB12 has length 409 aa. DNAJB12 has mass 45.5 kDA.
DNAJB13 has names RSPH16A, TSARG6. DNAJB13 is located in Intracellular. DNAJB13 subcellular location is Plasma membrane. DNAJB13 has length 316 aa. DNAJB13 has mass 36.1 kDA.
DNAJB14 has names FLJ14281. DNAJB14 is located in Intracellular. DNAJB14 subcellular location is Endoplasmic reticulum and nuclear membrane. DNAJB14 has length 379 aa. DNAJB14 has mass 42.5 kDA.
DNAJC1 has names DNAJL1, ERdj1, MTJ1. DNAJC1 is located in Membrane. DNAJC1 subcellular location is Endoplasmic reticulum and nuclear membrane. DNAJC1 has length 554 aa. DNAJC1 has mass 63.9 kDA.
DNAJC2 has names MPHOSPH11, MPP11, ZRF1, ZUO1, zuotin. DNAJC2 is located in

Intracellular. DNAJC2 subcellular location is Cytosol and nucleus. DNAJC2 has length 621 aa. DNAJC2 has mass 72 kDA.
DNAJC3 has names ERdj6, HP58, P58, P58IPK, PRKRI. DNAJC3 is located in Intracellular. DNAJC3 subcellular location is Endoplasmic reticulum. DNAJC3 has length 504 aa. DNAJC3 has mass 57.6 kDA.
DNAJC4 has names HSPF2, MCG18. DNAJC4 is located in Intracellular. DNAJC4 subcellular location is Membrane. DNAJC4 has length 249 aa. DNAJC4 has mass 28.2 kDA.
DNAJC5 has names CLN4, DNAJC5A, FLJ00118, FLJ13070. DNAJC5 is located in Membrane. DNAJC5 subcellular location is Golgi apparatus, plasma membrane and additionally in vesicles. DNAJC5 has length 198 aa. DNAJC5 has mass 22.1 kDA.
DNAJC5B has names CSP-beta, MGC26226. DNAJC5B is located in Intracellular. DNAJC5B subcellular location is Membrane. DNAJC5B has length 199 aa. DNAJC5B has mass 22.5 kDA.
DNAJC5G has names CSP-gamma, FLJ40417. DNAJC5G is located in Membrane. DNAJC5G subcellular location is Membrane. DNAJC5G has length 189 aa. DNAJC5G has mass 21.4 kDA.
DNAJC6 has names KIAA0473, PARK19. DNAJC6 is located in Intracellular. DNAJC6 subcellular location is Cytosol and additionally in nucleoplasm, plasma membrane. DNAJC6 has length 970 aa. DNAJC6 has mass 105.7 kDA.
DNAJC7 has names TPR2, TTC2. DNAJC7 is located in Intracellular. DNAJC7 subcellular location is Nucleoplasm and additionally in cytosol. DNAJC7 has length 494 aa. DNAJC7 has mass 56.4 kDA.
DNAJC8 has names SPF31. DNAJC8 is located in Intracellular. DNAJC8 subcellular location is Nucleoplasm. DNAJC8 has length 253 aa. DNAJC8 has mass 29.8 kDA.
DNAJC9 has names JDD1, SB73. DNAJC9 is located in Intracellular. DNAJC9 subcellular location is Nucleoplasm and additionally in plasma membrane. DNAJC9 has length 260 aa. DNAJC9 has mass 29.9 kDA.
DNAJC10 has names ERdj5, PDIA19. DNAJC10 is located in Membrane. DNAJC10 subcellular location is Endoplasmic reticulum. DNAJC10 has length 793 aa. DNAJC10 has mass 91.1 kDA.
DNAJC11 has names FLJ10737. DNAJC11 is located in Intracellular. DNAJC11 subcellular location is Mitochondrial. DNAJC11 has length 559 aa. DNAJC11 has mass 63.3 kDA.
DNAJC12 has names JDP1. DNAJC12 is located in Intracellular. DNAJC12 subcellular location is Cytosol. DNAJC12 has length 198 aa. DNAJC12 has mass 23.4 kDA.
DNAJC13 has names KIAA0678, RME8. DNAJC13 is located in Membrane. DNAJC13 subcellular location is Vesicles and additionally in cytosol. DNAJC13 has length 2243 aa. DNAJC13 has mass 254.4 kDA.
DNAJC14 has names DNAJ, DRIP78, FLJ32792, HDJ3, LIP6. DNAJC14 is located in

Intracellular. DNAJC14 subcellular location is Endoplasmic reticulum membrane. DNAJC14 has length 702 aa. DNAJC14 has mass 78.6 kDA.
DNAJC15 has names DNAJD1, MCJ. DNAJC15 is located in Membrane. DNAJC15 subcellular location is Mitochondrial membrane. DNAJC15 has length 150 aa. DNAJC15 has mass 16.4 kDA.
DNAJC16 has names KIAA0962. DNAJC16 is located in Membrane. DNAJC16 subcellular location is Vesicles. DNAJC16 has length 782 aa. DNAJC16 has mass 90.6 kDA.
DNAJC17 has names FLJ10634. DNAJC17 is located in Intracellular. DNAJC17 subcellular location is Nucleoplasm. DNAJC17 has length 304 aa. DNAJC17 has mass 34.7 kDA.
DNAJC18 has names MGC29463. DNAJC18 is located in Intracellular. DNAJC18 subcellular location is Cell Junctions and additionally in cytosol. DNAJC18 has length 358 aa. DNAJC18 has mass 41.6 kDA.
DNAJC19 has names Pam18, Tim14, TIMM14. DNAJC19 is located in Membrane. DNAJC19 subcellular location is Mitochondrial membrane. DNAJC19 has length 116 aa. DNAJC19 has mass 12.5 kDA.
DNAJC20 has names DNAJC20, HSC20, Jac1. DNAJC20 is located in Intracellular. DNAJC20 subcellular location is Nucleoplasm, mitochondria, cytosol. DNAJC20 has length 235 aa. DNAJC20 has mass 27.4 kDA.
DNAJC21 has names DNAJA5, GS3, JJJ1. DNAJC21 is located in Intracellular. DNAJC21 subcellular location is Nucleus, nucleoli, cytosol. DNAJC21 has length 576 aa. DNAJC21 has mass 67.1 kDA.
DNAJC22 has names FLJ13236, wus. DNAJC22 is located in Membrane. DNAJC22 subcellular location is Vesicles. DNAJC22 has length 341 aa. DNAJC22 has mass 38.1 kDA.
DNAJC23 has names SEC63, ERdj2, PRO2507, SEC63L. DNAJC23 is located in Membrane. DNAJC23 subcellular location is Endoplasmic reticulum. DNAJC23 has length 760 aa. DNAJC23 has mass 88 kDA.
DNAJC24 has names DPH4, JJJ3, ZCSL3. DNAJC24 is located in Intracellular. DNAJC24 subcellular location is Cytosol. DNAJC24 has length 149 aa. DNAJC24 has mass 17.1 kDA.
DNAJC25 has names bA16L21.2.1. DNAJC25 is located in Membrane. DNAJC25 subcellular location is Nucleoplasm and additionally in cytosol. DNAJC25 has length 360 aa. DNAJC25 has mass 42.4 kDA.
DNAJC26 has names GAK (cyclin G–associated kinase. DNAJC26 is located in Intracellular. DNAJC26 subcellular location is Golgi apparatus and additionally in vesicles. DNAJC26 has length 1311 aa. DNAJC26 has mass 143.2 kDA.
DNAJC27 has names RabJS, RBJ. DNAJC27 is located in Intracellular. DNAJC27 subcellular location is Nucleoplasm and additionally in cytosol. DNAJC27 has length

273 aa. DNAJC27 has mass 30.9 kDA.
DNAJC28 has names C21orf55, C21orf78. DNAJC28 is located in Intracellular. DNAJC28 subcellular location is Golgi transport complex. DNAJC28 has length 388 aa. DNAJC28 has mass 45.8 kDA.
DNAJC29 has names SACS, ARSACS, DKFZp686B15167, KIAA0730, PPP1R138, SPAX6. DNAJC29 is located in Intracellular. DNAJC29 subcellular location is Cytosol. DNAJC29 has length 4579 aa. DNAJC29 has mass 521.1 kDA.
DNAJC30 has names WBSCR18. DNAJC30 is located in Membrane. DNAJC30 subcellular location is Mitochondrial membrane. DNAJC30 has length 226 aa. DNAJC30 has mass 26 kDA.
Chaperonins/HSP60/HSPD has names . Chaperonins/HSP60/HSPD is located in . Chaperonins/HSP60/HSPD subcellular location is . Chaperonins/HSP60/HSPD has length aa. Chaperonins/HSP60/HSPD has mass kDA.
HSPD1 has names HLD4, CPN60, GROEL, HSP60, HSPD1, HSP65, SPG13, HSP-60, HuCHA60. HSPD1 is located in Intracellular. HSPD1 subcellular location is Mitochondria. HSPD1 has length 573 aa. HSPD1 has mass 61 kDA.
CCT1 has names TCP1, CCTA, CCT-alpha, TCP-1-alpha, D6S230E. CCT1 is located in Intracellular. CCT1 subcellular location is Cytosol, centrosome. CCT1 has length 556 aa. CCT1 has mass 60 kDA.
CCT2 has names CCTB, CCT-beta, TCP-1-beta, HEL-S-100n, 99D8.1, PRO1633. CCT2 is located in Intracellular. CCT2 subcellular location is Cytosol. CCT2 has length 535 aa. CCT2 has mass 57 kDA.
CCT3 has names CCTG, CCT-gamma, TCP-1-gamma, TRiC5, PIG48. CCT3 is located in Intracellular. CCT3 subcellular location is Plasma membrane, cytosol. CCT3 has length 545 aa. CCT3 has mass 61 kDA.
CCT4 has names CCTD, CCT-delta, TCP-1-delta, SRB. CCT4 is located in Intracellular. CCT4 subcellular location is Cytosol and additionally in nucleoplasm. CCT4 has length 539 aa. CCT4 has mass 58 kDA.
CCT5 has names CCTE, CCT-epsilon, TCP-1-epsilon, KIAA0098, HEL-S-69, PNAS-102. CCT5 is located in Intracellular. CCT5 subcellular location is Cytoplasm and cytoskeleton. CCT5 has length 541 aa. CCT5 has mass 60 kDA.
CCT6A has names CCT6, CCTZ, CCT-zeta, CCT-zeta1, TCP-1-zeta, HTR3, TCP20, TTCP20. CCT6A is located in Intracellular. CCT6A subcellular location is Cytosol. CCT6A has length 531 aa. CCT6A has mass 58 kDA.
CCT6B has names CCTZ2, CCT-zeta2, TSA303. CCT6B is located in Intracellular. CCT6B subcellular location is Cytosol. CCT6B has length 530 aa. CCT6B has mass 58 kDA.
CCT7 has names CCTH, CCT-eta, TCP-1-eta, NIP7-1. CCT7 is located in Intracellular. CCT7 subcellular location is Cytosol. CCT7 has length 543 aa. CCT7 has mass 59 kDA.

CCT8 has names CCTQ, CCT-theta, TCP-1-theta, KIAA002, PRED71. CCT8 is located in Intracellular. CCT8 subcellular location is Intermediate filaments and additionally in cytosol, nucleoplasm. CCT8 has length 548 aa. CCT8 has mass 60 kDA.
HSP70/HSPA has names . HSP70/HSPA is located in . HSP70/HSPA subcellular location is . HSP70/HSPA has length aa. HSP70/HSPA has mass kDA.
HSPA1A has names HSP70.1, HSP70-1, HSP72, HSPA1, HSX70. HSPA1A is located in Intracellular. HSPA1A subcellular location is Nucleoplasm, vesicles and additionally in cytosol. HSPA1A has length 641 aa. HSPA1A has mass 70 kDA.
HSPA1B has names HSP70.2, HSP70-2, HSP72, HSPA1, HSX70. HSPA1B is located in Intracellular. HSPA1B subcellular location is Nucleoplasm, vesicles and additionally in cytosol. HSPA1B has length 641 aa. HSPA1B has mass 70 kDA.
HSPA1L has names HSP70-HOM, Hum70t, HSP70-1L. HSPA1L is located in Intracellular. HSPA1L subcellular location is Vesicles and additionally in nucleoplasm. HSPA1L has length 641 aa. HSPA1L has mass 70 kDA.
HSPA2 has names HSP70-2, HSP70-3. HSPA2 is located in Intracellular. HSPA2 subcellular location is Vesicles and additionally in nucleoplasm. HSPA2 has length 639 aa. HSPA2 has mass 70 kDA.
HSPA5 has names BiP, GRP78, MIF2. HSPA5 is located in Intracellular. HSPA5 subcellular location is Cytosol. HSPA5 has length 654 aa. HSPA5 has mass 72 kDA.
HSPA6 has names HSP70B'. HSPA6 is located in Intracellular. HSPA6 subcellular location is Vesicles and additionally in nucleoplasm. HSPA6 has length 643 aa. HSPA6 has mass 71 kDA.
HSPA8 has names HSC70, HSP73, HSC71, HSPA10. HSPA8 is located in Intracellular. HSPA8 subcellular location is Nucleoplasm and additionally in vesicles. HSPA8 has length 646 aa. HSPA8 has mass 71 kDA.
HSPA9 has names Mortalin, GRP75, mt-HSP70, HSPA9B. HSPA9 is located in Intracellular. HSPA9 subcellular location is Mitochondria. HSPA9 has length 679 aa. HSPA9 has mass 74 kDA.
HSPA12A has names KIAA0417. HSPA12A is located in Intracellular. HSPA12A subcellular location is Golgi apparatus, cytosol. HSPA12A has length 675 aa. HSPA12A has mass 75 kDA.
HSPA12B has names C20orf60. HSPA12B is located in Intracellular. HSPA12B subcellular location is Nucleoplasm. HSPA12B has length 686 aa. HSPA12B has mass 76 kDA.
HSPA13 has names STCH. HSPA13 is located in Intracellular. HSPA13 subcellular location is Microsomes. HSPA13 has length 471 aa. HSPA13 has mass 52 kDA.
HSPA14 has names HSP70L1, HSP60, HSP70-4,. HSPA14 is located in Intracellular. HSPA14 subcellular location is in cell.. HSPA14 has length 509 aa. HSPA14 has mass 55 kDA.
HSP90/HSPC has names . HSP90/HSPC is located in . HSP90/HSPC subcellular

location is . HSP90/HSPC has length aa. HSP90/HSPC has mass kDA.
HSP90AA1 has names LAP2, HSP86, HSPC1, HSPCA, HSP89A, HSP89, HSP90, HSP90A, HSP90-alpha, Renal Carcinoma Antigen NY-REN-38, EL52, FLJ31884. HSP90AA1 is located in Intracellular. HSP90AA1 subcellular location is Cytosol. HSP90AA1 has length 854 aa. HSP90AA1 has mass 98 kDA.
HSP90AA2 has names LAP2, HSP86, HSPC1, HSPCA, HSP89A, HSP89, HSP90, HSP90A, HSP90-alpha, Renal Carcinoma Antigen NY-REN-38, EL52,. HSP90AA2 is located in Intracellular. HSP90AA2 subcellular location is Cytosol. HSP90AA2 has length 732 aa. HSP90AA2 has mass 85 kDA.
HSP90AB1 has names HSPC2, HSPCB, D6S182, HSP90B, HSP90-beta, HSP84. HSP90AB1 is located in Intracellular. HSP90AB1 subcellular location is Cytosol. HSP90AB1 has length 724 aa. HSP90AB1 has mass 83 kDA.
HSP90B1 has names ECGP, GP96, TRA1, GRP94, endoplasmin, HEL35, HEL-S-125m. HSP90B1 is located in Intracellular. HSP90B1 subcellular location is Endoplasmic reticulum. HSP90B1 has length 803 aa. HSP90B1 has mass 92 kDA.
TRAP1 has names HSP75, HSP90L. TRAP1 is located in Intracellular. TRAP1 subcellular location is Mitochondria. TRAP1 has length 704 aa. TRAP1 has mass 80 kDA.
HSP110/HSPH has names . HSP110/HSPH is located in . HSP110/HSPH subcellular location is . HSP110/HSPH has length aa. HSP110/HSPH has mass kDA.
HSPH1 has names HSP110, HSP105A, HSP105B, KIAA0201, NY-CO-25. HSPH1 is located in Intracellular. HSPH1 subcellular location is Cytosol and additionally in nucleoplasm. HSPH1 has length 858 aa. HSPH1 has mass 97 kDA.
HSPH2 has names HSPA4, APG2, HSP70RY. HSPH2 is located in Intracellular. HSPH2 subcellular location is Nucleoplasm, cytosol. HSPH2 has length 840 aa. HSPH2 has mass 94 kDA.
HSPH3 has names HSPA4L, APG1, OSP94. HSPH3 is located in Intracellular. HSPH3 subcellular location is Centrosome, cytosol. HSPH3 has length 839 aa. HSPH3 has mass 95 kDA.
HSPH4 has names HYOU1, GRP170, ORP150, HSP12A. HSPH4 is located in Intracellular. HSPH4 subcellular location is Endoplasmic reticulum. HSPH4 has length 999 aa. HSPH4 has mass 111 kDA.

RDF: