Q5: Relabel sequences for alignment

>Human\_STAT1 |NP\_009330.1 signal transducer and activator of transcription 1-alpha/beta isoform alpha [Homo sapiens]

KRNLQDNFQEDPIQMSMIIYSCLKEERKILENAQRFNQAQSGNIQSTVMLDKQK

ELDSKVRNVKDKVMCIEHEIKSLEDLQDEYDFKCKTLQNREHETNGVAKSDQKQEQLLLKKMYLMLDNKR

KEVVHKIIELLNVTELTQNALINDELVEWKRRQQSACIGGPPNACLDQLQNWFTIVAESLQQVRQQLKKL

EELEQKYTYEHDPITKNKQVLWDRTFSLFQQLIQSSFVVERQPCMPTHPQRPLVLKTGVQFTVKLRLLVK

LQELNYNLKVKVLFDKDVNERNTVKGFRKFNILGTHTKVMNMEESTNGSLAAEFRHLQLKEQKNAGTRTN

EGPLIVTEELHSLSFETQLCQPGLVIDLETTSLPVVVISNVSQLPSGWASILWYNMLVAEPRNLSFFLTP

PCARWAQLSEVLSWQFSSVTKR

>Ferret\_STAT1

KRNLQDNFQEDPVQMSMIICNCLKEERRILENAQRFNQAQSGSIQSTVMLDKQKELDSKVRNVKDKVMCIEHEIKTLEDLQDEYDFKCKTLQNREHETNGVAKNDQKQEQLLIQKMYLMLDNKRKEVVLKIIELLNVTELTQKALINDELVEWKQRQQSACIGGPPNACLDQLQNWFTIVAESLQQVRQQLKKLEELEQKYTYEHDPITKNKQGLWDRTFSLFQQLIQSSFVVERQPCMPTHPQRPLVLKTGVQFTVKLRLLVKLQELNYNLKVKVLFDKDVNERNTVKGFRKFNILGTHTKVMNMEESTNGSLAAEFRHLQLKEQKNAGTRTNEGPLIVTEELSLLSFETTCSSLVWSLTSERPLGPFGDLQGRPLPRGWASILVETIVGTNPEIVLLFNPPGDEGSALGETSWSFSSSHKR

>Sea\_otter |XP\_022354714.1:87-512| signal transducer and activator of transcription 1-alpha/beta isoform X1 [Enhydra lutris kenyoni]

KRNLQDNFQEDPIQMSMIICNCLKEERRILENAQRFNQAQSGSIQNTVMLDKQKELDSKVRNVKDKVMCI

EHEIKTLEDLQDEYDFKCKTLQNREHETNGVAKNDQKQEQLLIQKMYLMLDNKRKEVVLKIIELLNVTEL

TQKALINDELVEWKQRQQSACIGGPPNACLDQLQNWFTIVAESLQQVRQQLKKLEELEQKYTYEHDPITK

NKQGLWDRTFSLFQQLIQSSFVVERQPCMPTHPQRPLVLKTGVQFTVKLRLLVKLQELNYNLKVKVLFDK

DVNERNTVKGFRKFNILGTHTKVMNMEESTNGSLAAEFRHLQLKEQKNAGTRTNEGPLIVTEELHSLSFE

TQLCQPGLVIDLETTSLPIVVISNVSQLPSGWASILWYNMLVTEPRNLSFFLNPPCARWSQLSEVLSWQF

SSVTKR

>Cat |XP\_006935505.1:87-512 signal transducer and activator of transcription 1-alpha/beta [Felis catus]

KRNLQDNFQEDPIQMSMIIYNCLKEERKILENAQRFNQAQSGNIQSTVMLDKQKELDSKVRNVKDKVMCI

EHEIKTLEDLQDEYDFKCKTLQNREHETNGVAKNDQKQEQMLIKKMYLMLDSKRKEVVHKIIELLNITEL

TQKALINDELVEWKQRQQSACIGGPPNACLDQLQNWFTIVAESLQQVRQQLKKLEELEQKYTYEHDPITK

NKQGLWDRTFNLFQQLIQSSFVVERQPCMPTHPQRPLVLKTGVQFTVKLRLLVKLQELNYNLKVKVLFDK

DVNERNTVKGFRKFNILGTHTKVMNMEESTNGSLAAEFRHLQLKEQKNAGTRTNEGPLIVTEELHSLSFE

TQLCQPGLVIDLETTSLPIVVISNVSQLPSGWASILWYNMLVTEPRNLSFFLNPPCARWSQLSEVLSWQF

SSVTKR

>Polar\_bear |XP\_008685758.1:146-571 PREDICTED: signal transducer and activator of transcription 1-alpha/beta [Ursus maritimus]

KRNLQDNFQEDPIQMSMIICNCLKEERKILENAQRFNQAQSGNIQSTVMLDKQKELDSKVRNVKDKVMCI

EHEIKTLEDLQDEYDFKCKTLQNREHEANGVAKNDQKQEQMLIQKMYLMLDNKRKEVVHKIIELLNVTEL

TQKALINDELVEWKQRQQSACIGGPPNACLDQLQNWFTIVAESLQQVRQQLKKLEELEQKYTYEHDPITK

NKQGLWDRTFSLFQQLIQSSFVVERQPCMPTHPQRPLVLKTGVQFTVKLRLLVKLQELNYNLKVKVLFDK

DVNERNTVKGFRKFNILGTHTKVMNMEESTNGSLAAEFRHLQLKEQKNAGTRTNEGPLIVTEELHSLSFE

TQLCQPGLVIDLETTSLPVVVISNVSQLPSGWASILWYNMLVTEPRNLSFFLNPPCARWSQLSEVLSWQF

SSVTKR

>Finless\_porpoise |XP\_024589435.1:87-512 signal transducer and activator of transcription 1-alpha/beta [Neophocaena asiaeorientalis asiaeorientalis]

KRNLQDNFQEDPIQMSMIICNCLKEERKILENAQRFNQAQAGNIQSTVMLDKQQELDSRVRNVKDKVMCI

EHEIKTLEDLQDEYDFKCKTLQNREHETNGVAKNDQKQEQMLLQKMYLMLDNKRKEVVHKIIELLNVTEL

TQKALINDELVEWKRRQQSACIGGPPNACLDQLQNWFTIVAESLQQVRQQLKKLEELEQKYTYEHDPITK

NKQALWDRTFSLFQQLIQSSFVVERQPCMPTHPQRPLVLKTGVQFTVKLRLLVKLQELNYNLKVKVLFDK

DVNERNTVKGFRKFNILGTHTKVMNMEESTNGSLAAEFRHLQLKEQKNAGARTNEGPLIVTEELHSLSFE

TQLCQPGLVIDLETASLPIVVISNVSQLPSGWASILWYNMLVAEPRNLSFFLNPPCARWSQLSEVLSWQF

SSVTKR

>Beluga\_whale |XP\_022422976.1:87-512 signal transducer and activator of transcription 1-alpha/beta isoform X1 [Delphinapterus leucas]

KRNLQDNFQEDPIQMSMIICNCLKEERKILENAQRFNQAQAGNIQSTVMLDKQQELDSRVRNVKDKVMCI

EHEIKTLEDLQDEYDFKCKTLQNREHETNGVAKNDQKQEQMLLQKMYLMLDNKRKEVVHKIIELLNATEL

TQKALINDELVEWKRRQQSACIGGPPNACLDQLQNWFTIVAESLQQVRQQLKKLEELEQKYTYEHDPITK

NKQALWDRTFSLFQQLIQSSFVVERQPCMPTHPQRPLVLKTGVQFTVKLRLLVKLQELNYNLKVKVLFDK

DVNERNTVKGFRKFNILGTHTKVMNMEESTNGSLAAEFRHLQLKEQKNAGARTNEGPLIVTEELHSLSFE

TQLCQPGLVIDLETASLPIVVISNVSQLPSGWASILWYNMLVAEPRNLSFFLNPPCARWSQLSEVLSWQF

SSVTKR

>Horse |XP\_001499419.2:87-512 signal transducer and activator of transcription 1-alpha/beta [Equus caballus]

KRNLQDNFQEDPIQMSMIICSCLKEERKILENAQRFNQAQSGNIQSTVMLDKQKELDSRVRNVKDKVMCI

EQEIKTLEDLQDEYDFKCKTSQNREHEANGVAKNDQKQEQMLLQKMYLMLDNKRKEVVHKIIELLNVTEL

TQKALINDELVEWKRRQQSACIGGPPNACLDQLQNWFTIVAESLQQVRQQLKKLEELEQKYTYEHDPITK

NKQGLWDRTFSLFQQLIQNSFVVERQPCMPTHPQRPLVLKTGVQFTVKLRLLVKLQELNYNLKVKVLFDK

DVNERNTVKGFRKFNILGTHTKVMNMEESTNGSLAAEFRHLQLKEQKNAGTRTNEGPLIVTEELHSLSFE

TQLCQPGLVIDLETTSLPVVVISNVSQLPSGWASILWYNMLVAEPRNLSFFLNPPCARWSQLSEVLSWQF

SSVTKR

>African\_bush\_elephant |XP\_010600974.1 signal transducer and activator of transcription 1-alpha/beta [Loxodonta africana]

KRNLQDNFQEDPILMSMIICNCLKEERKILENAQRFNQAQSGNIQSTVMLDKQK

ELDSKVRNVKDKVMCIEHEIKTLEDLQDEYDFKCKTLQNREHETSGAAKNEQKEEQMLLQKMYLMLDNKR

KEVVHKIIELLNVTELTQNALINDELVEWKRRQQSACIGGPPNACLDQLQNWFTIVAESLQQARQQLKKL

EELEQKYTYEHDPITKNKQVLWDRTFTLFQQLIQSSFVVERQPCMPTHPQRPLVLKTGVQFTVKLRLLVK

LQELNYNLTVKVLFDKDVNERNTVKGFRKFNILGTHKKVMNMEESTNGSLAAEFRHLQLKEQKNAGTRTN

EGPLIVTEELHSFSFETQLCQPGLVIDLETTSLPVVVISNVSQLPSGWASILWYNMLVAEPRNLSFFLNP

PCAQWAQLSEVLSWQFSSVTKR

>Bovine |XP\_005202627.2 signal transducer and activator of transcription 1-alpha/beta isoform X1 [Bos taurus]

KRNLQDNFQEDPIQMSMIICNCLKEERKILDHAQRISQAQSGNIQSTVMLDKQK

ELDSKVRNVKDKVMSIEHEIKTLEDLQDEYDFKCKTLQNREHETNGVAKNDQKQEQLLLQKMYLMLDNKR

KEVVLKIIELLNATELTQKALINDELVEWKRRQQSACIGGPPNACLDQLQNWFTIVAESLQQVRQQLKKL

EELEQKYTYEHDPITKNKQALWDRTFSLFQQLIQSSFVVERQPCMPTHPQRPLVLKTGVQFTVKLRLLVK

LQELNYNLKVKVLFDKDVNERNTVKGFRKFNILGTHTKVMNMEESTNGSLAAEFRHLQLKEQKNAGARTN

EGPLIVTEELHSLSFETQLCQPGLVIDLETTSLPVVVISNVSQLPSGWASILWYNMLVAEPRNLSFFLNP

PCARWSQLSEVLSWQFSSVTKR

**Alignment:**

Obtained using MUSCLE (version 3.8) at EBI: (see the next page)

A close up of text on a black background

Description automatically generated





Q6: Phylogeny Tree: Use MUSCLE from EBI (Tool>Phylogeny>Simple Phylogeny)

A screenshot of a cell phone

Description automatically generated

Q7: Heatmap

A screenshot of a cell phone

Description automatically generated

Q8:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ID | Technique | Resolution | Source | Evalue | Identity |
| 1YVL | X-Ray Diffraction | 3.0 | Homo sapiens | 0.00e+00 | 96.714 |
| 1BF5 | X-Ray Diffraction | 2.9 | Homo sapiens | 0.00e+00 | 96.817 |
| 3CWG | X-Ray Diffraction | 3.05 | Mus musculus | 2.66e-141 | 53.827 |

Q9.