|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Horse |  | Chicken |  | Tuna |  | Frog |  | Human |  | Shark |  | Turtle |  | Monkey |  | Rabbit |
| 42 | **Gln** |  | **Gln** |  | **Gln** |  | **Gln** |  | **Gln** |  | **Gln** |  | **Gln** |  | **Gln** |  | **Gln** |
| 43 | **Ala** |  | **Ala** |  | **Ala** |  | **Ala** |  | **Ala** |  | **Ala** |  | **Ala** |  | **Ala** |  | **Ala** |
| 44 | **Pro** |  | **Glu** |  | **Glu** |  | **Ala** |  | **Pro** |  | **Gln** |  | **Glu** |  | **Pro** |  | **Tyr** |
| 46 | **Phe** |  | **Phe** |  | **Tyr** |  | **Phe** |  | **Tyr** |  | **Phe** |  | **Phe** |  | **Tyr** |  | **Pro** |
| 47 | **Thr** |  | **Ser** |  | **Ser** |  | **Ser** |  | **Ser** |  | **Ser** |  | **Ser** |  | **Ser** |  | **Ser** |
| 49 | **Thr** |  | **Thr** |  | **Thr** |  | **Thr** |  | **Thr** |  | **Thr** |  | **Thr** |  | **Thr** |  | **Thr** |
| 50 | **Asp** |  | **Asp** |  | **Asp** |  | **Asp** |  | **Ala** |  | **Asp** |  | **Asp** |  | **Ala** |  | **Asp** |
| 53 | **Lys** |  | **Lys** |  | **Lys** |  | **Lys** |  | **Lys** |  | **Lys** |  | **Lys** |  | **Lys** |  | **Lys** |
| 54 | **Asn** |  | **Asn** |  | **Ser** |  | **Asn** |  | **Asn** |  | **Ser** |  | **Asn** |  | **Asn** |  | **Asn** |
| 55 | **Lys** |  | **Lys** |  | **Lys** |  | **Lys** |  | **Lys** |  | **Lys** |  | **Lys** |  | **Lys** |  | **Lys** |
| 56 | **Gly** |  | **Gly** |  | **Gly** |  | **Gly** |  | **Gly** |  | **Gly** |  | **Gly** |  | **Gly** |  | **Gly** |
| 57 | **Ile** |  | **Ile** |  | **Ile** |  | **Ile** |  | **Ile** |  | **Ile** |  | **Ile** |  | **Ile** |  | **Ile** |
| 58 | **Thr** |  | **Thr** |  | **Val** |  | **Thr** |  | **Ile** |  | **Thr** |  | **Thr** |  | **Ile** |  | **Thr** |
| 60 | **Lys** |  | **Gly** |  | **Asn** |  | **Gly** |  | **Gly** |  | **Gln** |  | **Gly** |  | **Gly** |  | **Gly** |
| 61 | **Glu** |  | **Glu** |  | **Asn** |  | **Glu** |  | **Glu** |  | **Gln** |  | **Glu** |  | **Glu** |  | **Glu** |
| 62 | **Glu** |  | **Asp** |  | **Asp** |  | **Asp** |  | **Asp** |  | **Glu** |  | **Glu** |  | **Asp** |  | **Asp** |
| 63 | **Thr** |  | **Thr** |  | **Thr** |  | **Thr** |  | **Thr** |  | **Thr** |  | **Thr** |  | **Thr** |  | **Thr** |
| 64 | **Leu** |  | **Leu** |  | **Leu** |  | **Leu** |  | **Leu** |  | **Leu** |  | **Leu** |  | **Leu** |  | **Leu** |
| 65 | **Met** |  | **Met** |  | **Met** |  | **Met** |  | **Met** |  | **Arg** |  | **Met** |  | **Met** |  | **Met** |
| 66 | **Glu** |  | **Glu** |  | **Glu** |  | **Glu** |  | **Glu** |  | **Ile** |  | **Glu** |  | **Glu** |  | **Glu** |
| 100 | **Lys** |  | **Asp** |  | **Ser** |  | **Ser** |  | **Lys** |  | **Lys** |  | **Asp** |  | **Lys** |  | **Lys** |
| 101 | **Ala** |  | **Ala** |  | **Ala** |  | **Ala** |  | **Ala** |  | **Thr** |  | **Ala** |  | **Ala** |  | **Ala** |
| 102 | **Thr** |  | **Thr** |  | **Thr** |  | **Gly** |  | **Thr** |  | **Ala** |  | **Thr** |  | **Ala** |  | **Thr** |
| 103 | **Asn** |  | **Ser** |  | **Ser** |  | **Ser** |  | **Asn** |  | **Ala** |  | **Ser** |  | **Asn** |  | **Asn** |
| 104 | **Glu** |  | **Lys** |  | **-** |  | **Lys** |  | **Glu** |  | **Ser** |  | **Lys** |  | **Glu** |  | **Glu** |

HEMOGLOBIN

**1) Compare the amino acid sequences. For each species, count the amino acids   
 in the sequence that differ from the human sequence.**

**2) Compare the amino acid sequences. Is the frog closer in relationship to the tuna or shark?**

**2) Compare the amino acid sequences. Is the chicken closer in   
 relationship to the horse or rabbit?**