

FUNCTION FINDERS BLAST

Answers sheet

Translate the DNA sequences to find the matching protein using Uniprot BLAST search:

DNA sequence 1 **atg aag tca gct att tta acc ggt ttg ctt ttc gtc**

Translated sequence **M K S A I L T G L L F V**

Protein name **Type-3 ice-structuring protein or antifreeze protein type 3**

Organism **Atlantic wolf fish (*Anarhichas lupus*)**

Protein function **A protein that prevents fish blood from freezing in sub-zero sea water. The protein binds to ice crystals to stop them growing.**

DNA sequence 2 **atg agt aaa gga gaa gaa ctt ttc act gga gtc gtt**

Translated sequence **M S K G E E L F T G V V**

Protein name **Green fluorescent protein (GFP)**

Organism **Jellyfish (*Aequorea victoria*)**

Protein function **A protein used by organisms such as jellyfish to communicate with each other. It can also be used by biologists in genetic engineering research as a marker to indicate the successful insertion of genes.**

DNA sequence 3 **gaa aac atg gag aac gat gaa aat att gtg tat ggt**

Translated sequence **E N M E N D E N I V Y G**

Protein name **Luciferase**

Organism **Firefly (*Luciola lateralis*)**

Protein function **An enzyme used by fireflies to create light in a process called bioluminescence.**

DNA sequence 4 **ggt tgg gct ttg cgg atc atg ttt cta cat ctg tac**

Translated sequence **G W A L R I M F L H L G**

Protein name **Odorant receptor protein OR1**

Organism **Mosquito (*Anopheles gambiae*)**

Protein function **A special receptor which helps animals such as mosquitoes detect specific chemicals or smells in their environment.**

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Translate the DNA sequences to find the matching protein using Uniprot BLAST search:

DNA sequence 5 **cct ggg gag aac cta tgc tat aga aag atg tgg tgc**

Translated sequence **P G E N L C Y R K M W C**

Protein name **Alpha-bungarotoxin**

Organism **Many-banded Krait (*Bungarus multicinctus*)**

Protein function **A potent neurotoxin in snake venom. It blocks signals between nerve and muscle cells, which prevents the muscles from working, paralysing the snakes prey.**

DNA sequence 6 **ccc aga gag atc cag acc gcc gtg aga ctg tta ctc**

Translated sequence **P R E I Q T A V R L L L**

Protein name **Histone H2B**

Organism **Pea (*Pisum sativum*)**

Protein function **An enzyme that winds DNA so that it can be condensed into chromosomes allowing it to fit inside the nucleus of each cell.**

DNA sequence 7 **gag aag aga aag ctg ttt atc cgt tcc atg ggt gaa**

Translated sequence **E K R K L F I R S M G E**

Protein name **Caspase 1**

Organism **Human (*Homo sapiens*)**

Protein function **An enzyme that destroys cellular proteins leading to apoptosis or programmed cell death.**

DNA sequence 8 **atg gag ttt act ttg agg caa gag gct tta gtt aat**

Translated sequence **M E F T L R Q E A L V N**

Protein name **Leghaemoglobin**

Organism **Broad bean (*Vicia faba*)**

Protein function **A protein that binds oxygen controlling the levels of oxygen in the root nodules of leguminous plants. This allows nitrogen fixation to take place.**