3.7: SUPER ANIMAL DNA DECODER

PART 2: Decoding Animal DNA

DNA Sequence 1	ATG	AAG	TCC	GCC	GGA	TCA	GAA	TGA
Amino Acid Sequence	M	K	S	A	G	S	E	STOP
What protein does this DNA sequence code for?	mTOR							
Which animal does this DNA belong to? Why do you think this?	Axolotyl mTOR is a protein that helps to rebuild protein and regrow complex body parts. Axolotyls can regrow complex body parts like limbs and spinal cords.							

DNA Sequence 2	ATG	GAT	TAC	AGA	CGC	TCC	GCC	TAA
Amino Acid Sequence	M	D	Y	R	R	S	A	STOP
What protein does this DNA sequence code for?	Reflectin							
Which animal does this DNA belong to? Why do you think this?	Octopus Reflecting changes how skin cells reflect light, and an octopus can change its color to hide.							

DNA Sequence 3	ATG	CCG	GAG	TGG	GTT	AAG	GGA	TGA
Amino Acid Sequence	M	P	E	W	V	K	G	STOP
What protein does this DNA sequence code for?	Heat Shock Protein 70							
Which animal does this DNA belong to? Why do you think this?	Saharan silver ant This protein prevents cells from breaking apart in extreme temperatures, and the Saharan silver ant's superpower is surviving in temperatures up to 140 degrees Fahrenheit.							

DNA Sequence 4	ATG	AGA	CTC	CCG	TGG	CAG	GGA	TAA
Amino Acid Sequence	M	R	L	P	W	Q	G	STOP
What protein does this DNA sequence code for?	Myosin							
Which animal does this DNA belong to? Why do you think this?	Mantis shrimp Myosin helps muscles make super-powerful movements, and the mantis shrimp has one of the most powerful punches in the animal kingdom.							

DNA Sequence 5	ATG	GGA	GCA	GCT	GGC	AAG	GGT	TAA
Amino Acid Sequence	M	G	A	A	G	K	G	STOP
What protein does this DNA sequence code for?	Luciferase							
Which animal does this	Jellyfish							

DNA belong to? Why do you think this?	Luciferase reacts with another protein to produce light, and some kinds of jellyfish are able to glow.

DNA Sequence 6	ATG	CGG	GAA	TGG	GCT	GAA	CCT	TGA
Amino Acid Sequence	M	R	E	W	A	E	P	STOP
What protein does this DNA sequence code for?	Dsup (Damage Suppressor)							
Which animal does this DNA belong to? Why do you think this?	Tardigrade This protein protects DNA from radiation damage, and tardigrades can survive in environments with extreme radiation.							

DNA Sequence 7	ATG	ACT	GGT	CGG	TCT	GGC	GAT	TAA
Amino Acid Sequence	M	T	G	R	S	G	D	STOP
What protein does this DNA sequence code for?	Synaptotagmin							
Which animal does this DNA belong to? Why do you think this?	Archerfish This protein sends signals from the nerves to small muscles and is used in movements that require precise timing. The archerfish needs precise timing to shoot water out of its mouth and hit prey.							

DNA Sequence 8	ATG	GGC	CAA	CTC	AGG	AAT	TGG	TAA
Amino Acid Sequence	M	G	Q	L	R	N	W	STOP
What protein does this	Voltage-Gated Sodium Ion Channel Protein							

DNA sequence code for?	
Which animal does this DNA belong to? Why do you think this?	Electric eel This protein allows the body to build up and release powerful electric bursts, and electric eels are known for creating powerful electric shocks to stun prey.

Investigation Reflection

1. How does a DNA sequence lead to a specific trait in an animal? Try to explain the process in your own words.
   DNA is like a recipe or instruction book that tells the body how to make proteins. First, the DNA gets read in groups of 3 letters called codons. Each codon stands for one amino acid. The amino acids link together to make a protein. That protein then does a job in the body, like helping a jellyfish glow or helping an axolotl regrow its tail. So the DNA tells the body what kind of proteins to make, and those proteins help create traits.

2. What patterns did you notice about how all of the animal DNA sequences in this activity start and end? How do you think this helps DNA perform its function?
   All of the DNA sequences start with the same codon – ATG. This codon always stands for the same amino acid (represented by M). This codon tells the body where to start making the protein, kind of like a "start here" signal. All of the DNA sequences end in a codon that stands for "STOP." This signals the end of the protein, and it indicates when the protein is finished. This helps the body know when to start stringing amino acids together and when to stop because the protein is complete.

3. Do you think some DNA sequences can be found in more than one kind of animal? For example, could the DNA sequence that codes for myosin be found in the DNA of other animals? Why or why not?
   If you said that some DNA sequences are shared between animals, then you are correct! Mysin helps muscles move, and lots of animals (and even humans) have muscles. So it makes sense that many different animals would share the DNA for mysin because they all need this protein to move. There are some slightly different versions (with slightly different DNA variations), but all animals have some version of mysin.

4. Imagine you could "edit" an animal's DNA. What might happen if you changed just one codon in the DNA sequence for one of the

animal superpower proteins?

This is a chance for you to record your initial ideas about changes to DNA. You'll learn much more about this in the upcoming modules.