

Name: _____

Date: _____

From DNA to protein, Whose DNA is this?

Your assignment is to transcribe and then translate a strand of DNA into its corresponding proteins. This includes the process of transcription and translation. After you have translated your gene collaborate with other people in your class and find out what traits each protein impacts. Then try to find out whose DNA this is. You will need to confirm your staff member choice *outside* of class by comparing the traits given by your DNA strand, to the traits of ABHS staff members.

Below are the tasks and products you need to complete to finish this project.

- 1) Transcribe DNA: Create an mRNA strand the DNA- make sure you create the correct mRNA! (It would be good to double check with another group)
- 2) Translate: Create anti-codons that match your mRNA strand and build a polypeptide (chain of amino acids) from it.
- 3) Identify what proteins the gene codes for (check protein code with the attached key) and hypothesize who the DNA belongs to. It is recommended you collaborate with your classmates on this part!
- 4) Write a two-paragraph paper that summarized the process of translating this strand of DNA. Focus on transcription, processing, and translation, what they are and where they take place. Turn in your completed packet and include in your paper who you think the DNA belongs to (Hint: a staff member at the school).

1) *Hair color*

TACGGGTGTCACAGTTGAAGCATTAGCTCGACA

2) *Hitchhiker's Thumb?*

TACACGGCTTTTGGTCATGCCATCCATGCCAAGC

3) *Tongue rolling?*

TACGATTCTCCCCAGTGAAGCATCAGCTCGA

4) *Morton's Toe?*

TACATGAGGGTCTGGACTTCTGGCTCATA

5) *Earlobes*

TACAAGATGCAACTGTGACTCACTATTGTATA

6) *Widow's Peak?*

TACGTGTACGAGTGCTGATGGATCCTCCCC

7) *Eye color*

TACCCCTTTGATTGAGGTCTGATCCTGCTCG

8) *Sex*

TACAGTCTGCACCACTGAAAGCTCTCCGATTATA

9) *PTC taster?*

TACCACTTTCCCGTCTGAAGCTCCATCTATTG

10) *Handedness*

TACGGTCAGTGGCTGATTCTGCCCATCCCCTCAT

DNA Mystery Teacher Hunt Key

Trait # 1: Hair Color

Color	Protein Sequence
Brown	Methionine – Proline – Threonine – Valine – Serine – Threonine – Serine
Black	Methionine – Proline – Threonine – Valine – Arginine – Lysine – Serine
Red	Methionine – Leucine – Threonine – Valine – Serine – Threonine – Serine
Blonde	Methionine - Alanine – Histidine – Serine – Valine – Asparagine – Leucine – Valine

Trait #2: Hitchhiker's Thumb

Trait	Protein Sequence
Yes	Methionine – Cysteine – Arginine – Lysine – Proline – Valine - Arginine
No	Methionine – Cysteine – Arginine – Asparagine – Proline – Valine - Arginine

Trait #3: Tongue Rolling

Trait	Protein Sequence
Yes	Methionine – Leucine – Valine – Glycine – Arginine – Threonine - Serine
No	Methionine – Leucine – Arginine – Glycine – Valine – Threonine - Serine

Trait #4: Morton's Toe

Trait	Protein Sequence
Yes	Methionine – Tyrosine – Serine – Glutamine - Threonine
No	Methionine – Cysteine – Serine – Histidine - Threonine

Trait #5: Earlobes

Trait	Protein Sequence
Detached	Methionine – Phenylalanine – Tyrosine-Valine – Asparagine– Threonine– Glutamic acid
Attached	Methionine – Leucine – Cysteine – Asparagine – Threonine - Valine

Trait #6: Widow's Peak

Trait	Protein Sequence
Yes	Methionine – Histidine – Isoleucine – Leucine – Threonine – Threonine – Threonine
No	Methionine – Histidine – Methionine – Leucine – Threonine – Threonine – Threonine

Trait #7: Eye Color

Color	Protein Sequence
Hazel	Methionine – Glycine – Lysine – Leucine – Threonine– Proline - Aspartic acid
Green	Methionine – Glycine – Phenylalanine – Leucine – Threonine – Proline - Valine
Blue	Methionine – Glycine – Lysine – Leucine – Glutamic Acid – Proline - Valine
Brown	Methionine – Glycine – Lysine – Leucine – Threonine – Proline – Arginine - Serine

Trait #8: Sex

Trait	Protein Sequence
Male	Methionine – Serine – Aspartic acid – Valine- Valine – Threonine- Phenylalanine- Glutamic acid- Arginine – Leucine - Isoleucine
Female	Methionine – Serine – Aspartic acid – Arginine – Threonine – Tyrosine – Glutamic acid-Serine-Lysine- Leucine- Serine

Trait #9: PTC Tasting Ability

Trait	Protein Sequence
Strong Taster	Methionine – Serine – Serine – Glycine – Valine – Threonine - Lysine- Serine
Weak Taster	Methionine – Valine – Lysine – Glutamic acid – Serine – Threonine - Serine- Lysine
Non Taster	Methionine – Valine – Lysine – Glycine – Glutamine – Threonine - Serine-Arginine

Trait #10: Handedness

Trait	Protein Sequence
Left	Methionine – Alanine – Valine – Serine – Aspartic Acid
Right	Methionine – Proline – Valine – Threonine – Aspartic Acid