

Water ON

Translate only the
hydrophilic amino acids:

Arginine	Asparagine
Aspartate	Glutamate
Glutamine	Glycine
Lysine	Proline
Serine	Threonine



Water OFF

Translate only the
hydrophobic amino acids:

Alanine

Cysteine

Histidine

Isoleucine

Leucine

Methionine

Phenylalanine

Tryptophan

Tyrosine

Valine





5'



5'



Weak



Strong



Keto



Adenine



Guanine



Purine



Thymine



Cytosine



Pyrimidine



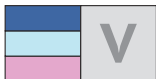
Not A



Not G



Amino



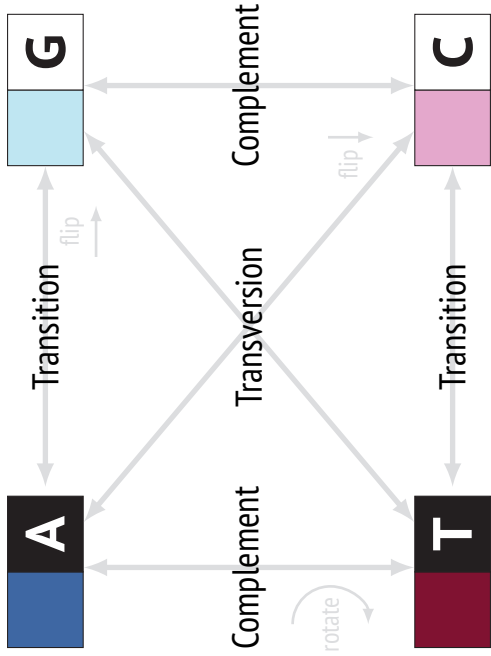
Not T

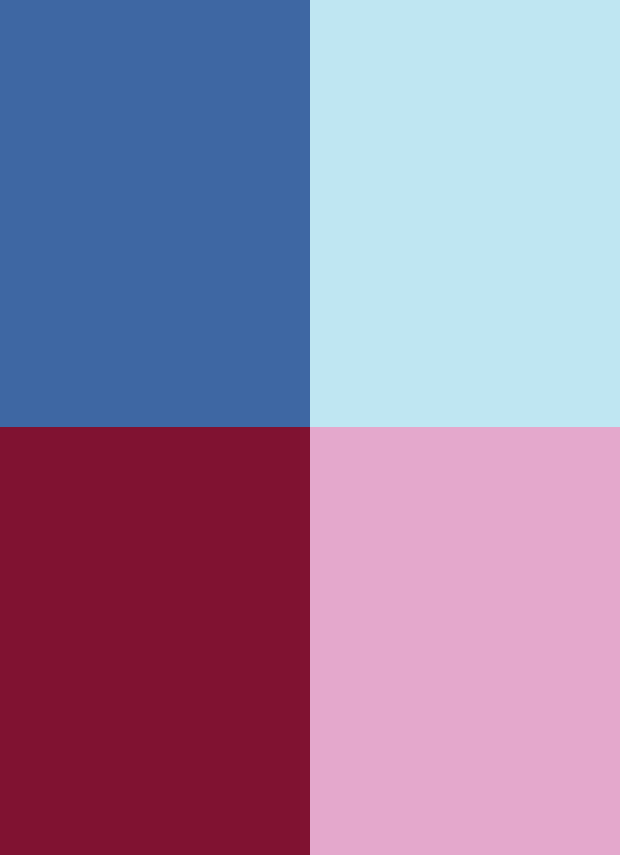


Not C



Any





Toggle Water ON/OFF

Buy: 0

Use: 1



Extend

Buy: 0

Use: 1



Roll the white die to insert a random nucleotide at the end of the sequence. May be used multiple times in one round.

Delete

Buy: 2

Use: 1



Delete any nucleotide
in the sequence.

Insert

Buy: 3

Use: 1



Roll the black die to
insert a random nucleotide
anywhere in the sequence.

Reverse Complement

Buy: 3

Use: 1



Swap the 5' and 3' ends
to read the sequence in
the opposite direction
on the opposite strand.

Complement

Buy: 3

Use: 2



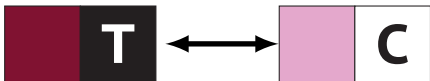
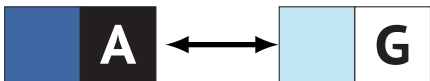
Rotate
any nucleotide
180 degrees.



Transition

Buy: 3

Use: 2



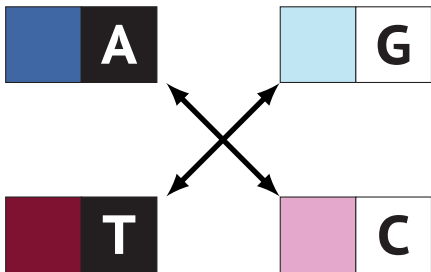
Flip
any nucleotide
horizontally.



Transversion

Buy: 3

Use: 2



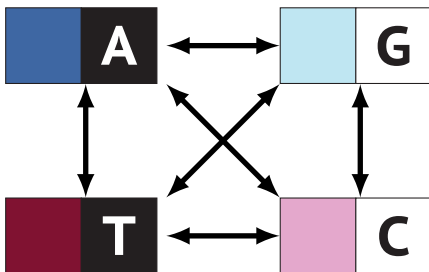
Flip
any nucleotide
vertically.



Mutate

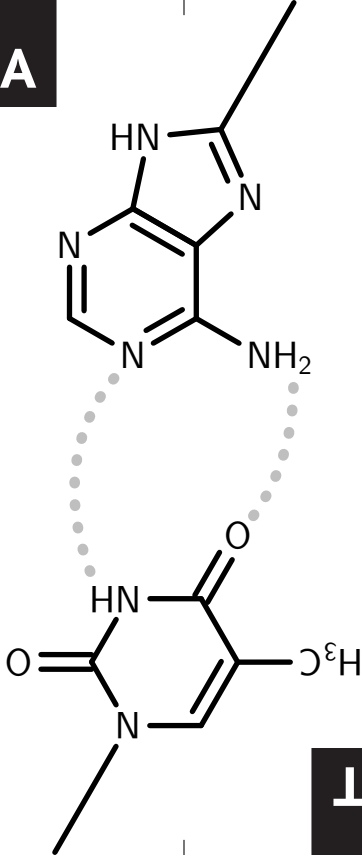
Buy: 5

Use: 3



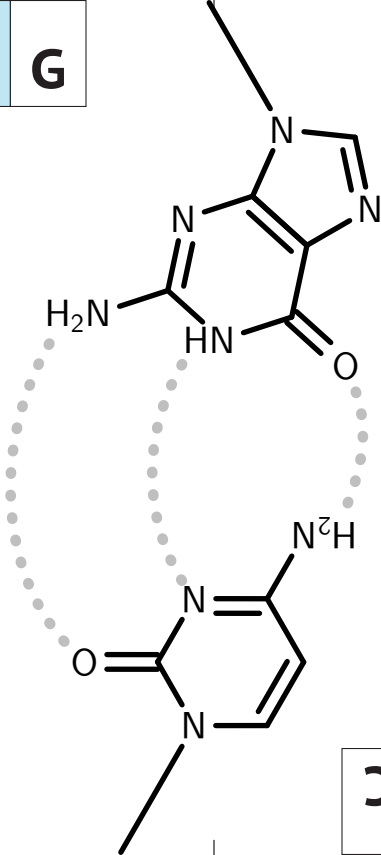
Rotate or Flip
any nucleotide
in any direction.

A

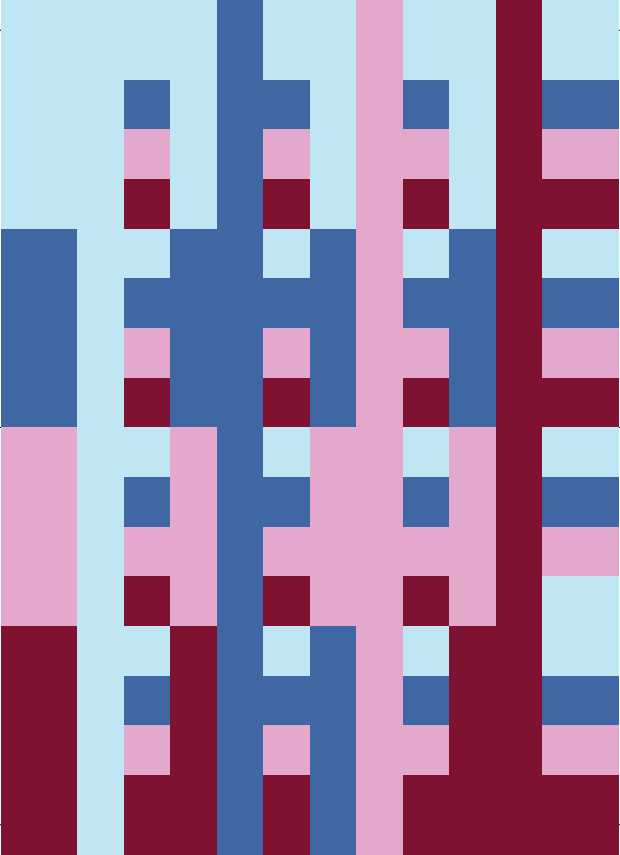


T

G



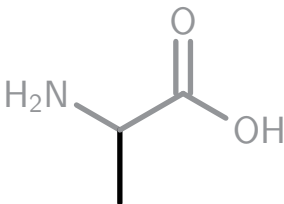
C



A Ala 

Alanine

	G
	C
	N



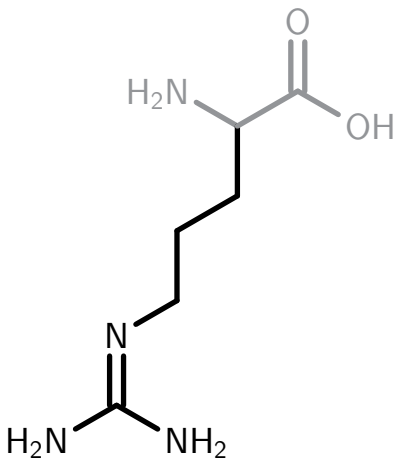
Aliphatic 

R^{Arg}

Redbeard Arginine

	C
	G
	N

	A
	G
	R

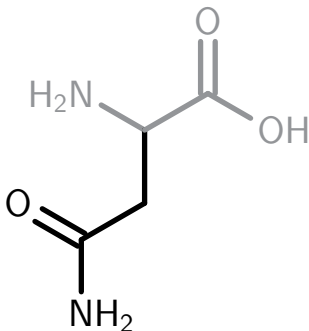


Basic ⊕



Nancy Asparagine

	A
	A
	Y
	Y



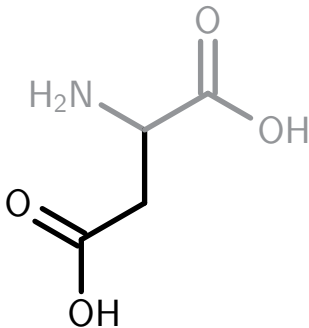
Small Polar (+ -)

Acid Deriv. (N)

D Asp 

Devin Aspartate

	G
	A
	Y

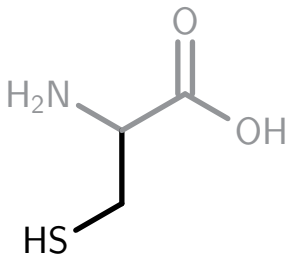


Acidic \ominus

C^{Cys}

Cy Cysteine

	T
	G
	Y



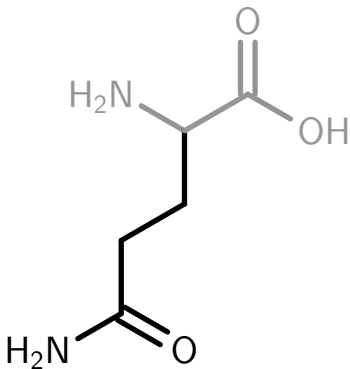
Small Polar (+-)

Sulfur (S)

Q^{Gln} 

Queen Glutamine

	C
	A
	R

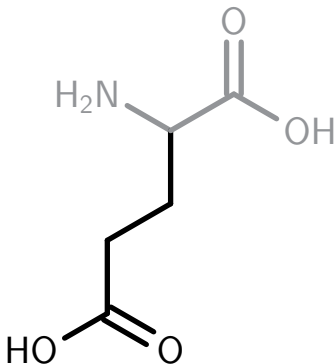


Acid Deriv. 



Edwin Glutamate

	G
	A
	R

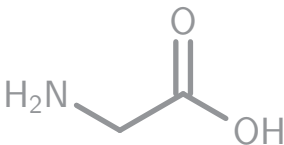


Acidic \ominus



Gladys Glycine

	G
	G
	N

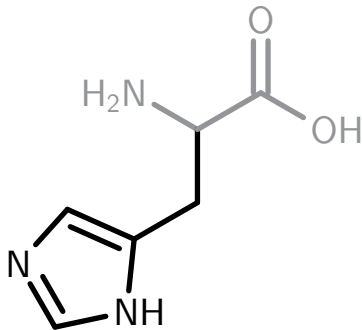


Unusual 

H^{His}

Hillary Histidine

	C
	A
	Y



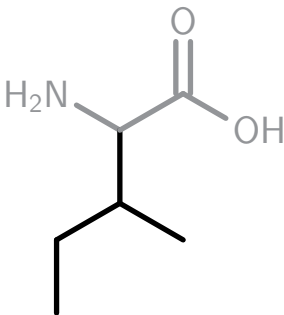
Aromatic 

Basic 

I^{Ile}

Iso Isoleucine

	A
	T
	H



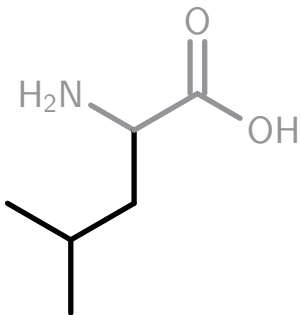
Aliphatic 

L Leu

Lucy Leucine

	C
	T
	N

	T
	T
	R

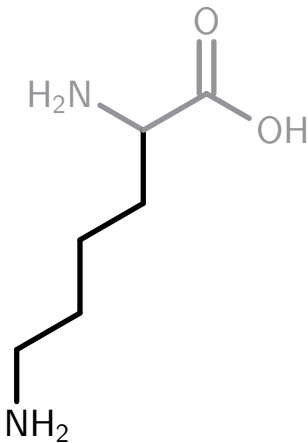


Aliphatic 



King Lysine

	A
	A
	R

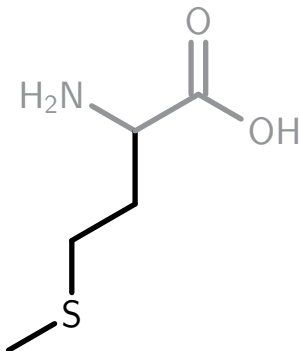


Basic \oplus

M^{Met}

Matt Methionine

	A
	T
	G



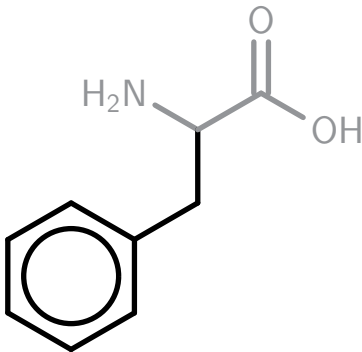
Sulfur 

Aliphatic 

F^{Phe}

Fred Phenylalanine

	T
	T
	Y
	Y

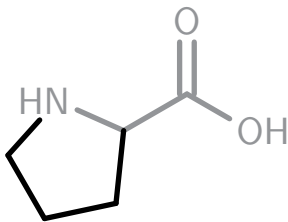


Aromatic 



Paul Proline

	C
	C
	N



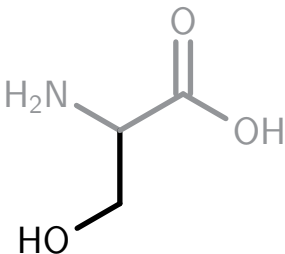
Unusual 



Sarah Serine

	T
	C
	N

	A
	G
	Y

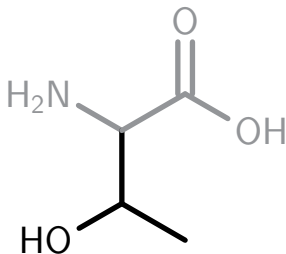


Small Polar (+-)

T^{Thr}


Thor Threonine

	A
	C
	N

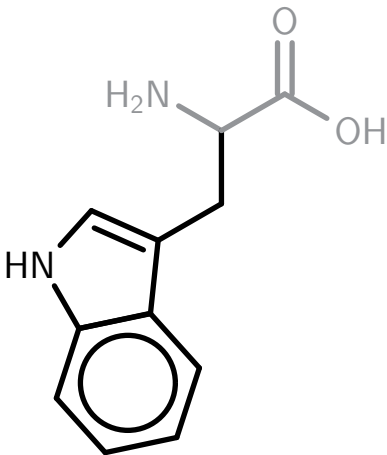


Small Polar (+-)

W^{Trp}

Wendy Tryptophan

	T
	G
	G

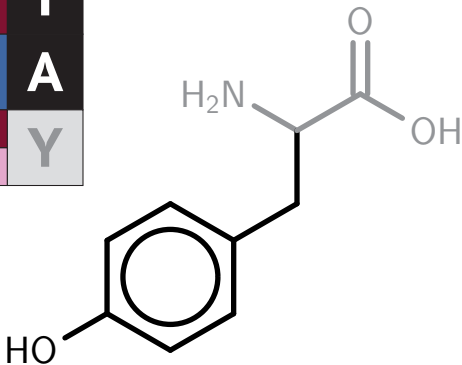


Aromatic 

Y^{Tyr}

Yvonne Tyrosine

	T
	A
	Y

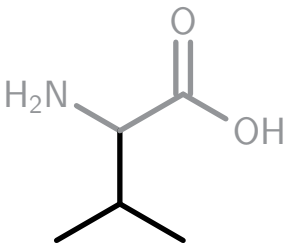


Aromatic 

V^{Val}

Valerie Valine

	G
	T
	N



Aliphatic 