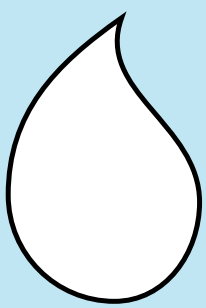
Water ON

Translate only the hydrophilic amino acids:

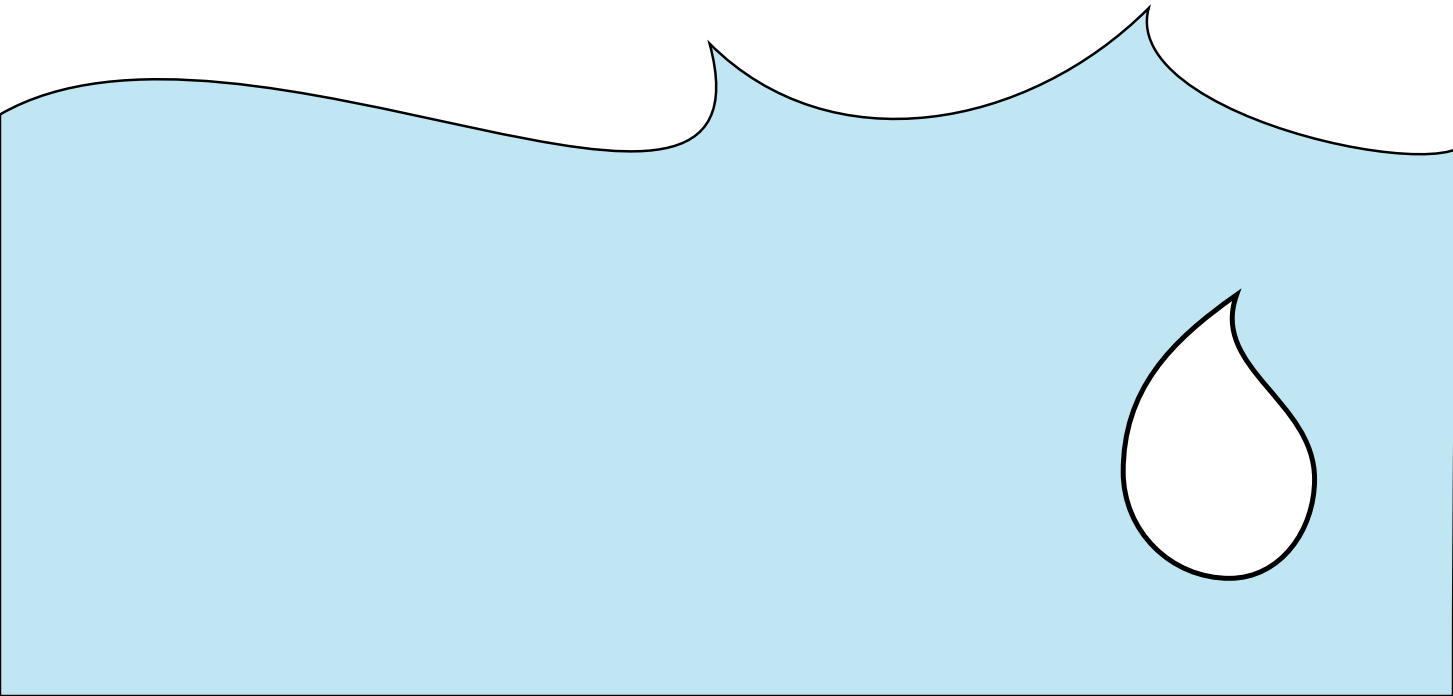
Arginine	Asparagine
Aspartate	Glutamate
Glutamine	Glycine
Lysine	Proline
Serine	Threonine



Water OFF

Translate only the hydrophobic amino acids:

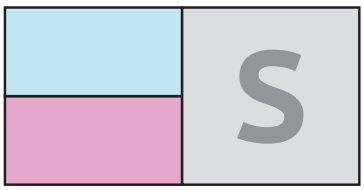
Alanine	Cysteine
Histidine	Isoleucine
Leucine	Methionine
Phenylalanine	Tryptophan
Tyrosine	Valine



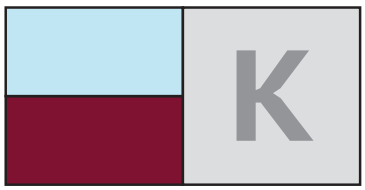
5’

5’

Weak

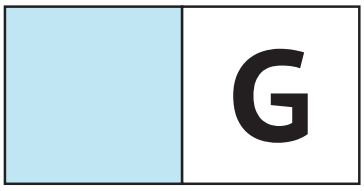


Strong



Keto

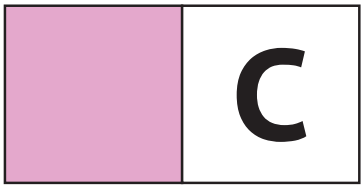
Adenine



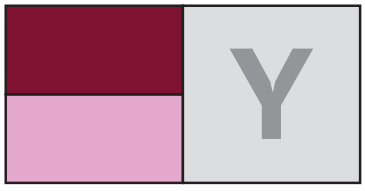
Guanine

Purine

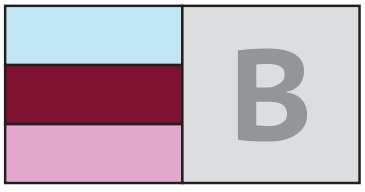
Thymine



Cytosine



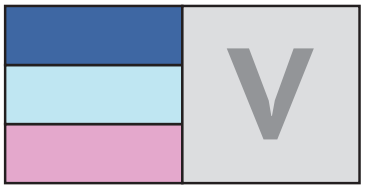
Pyrimidine



Not A

Not G

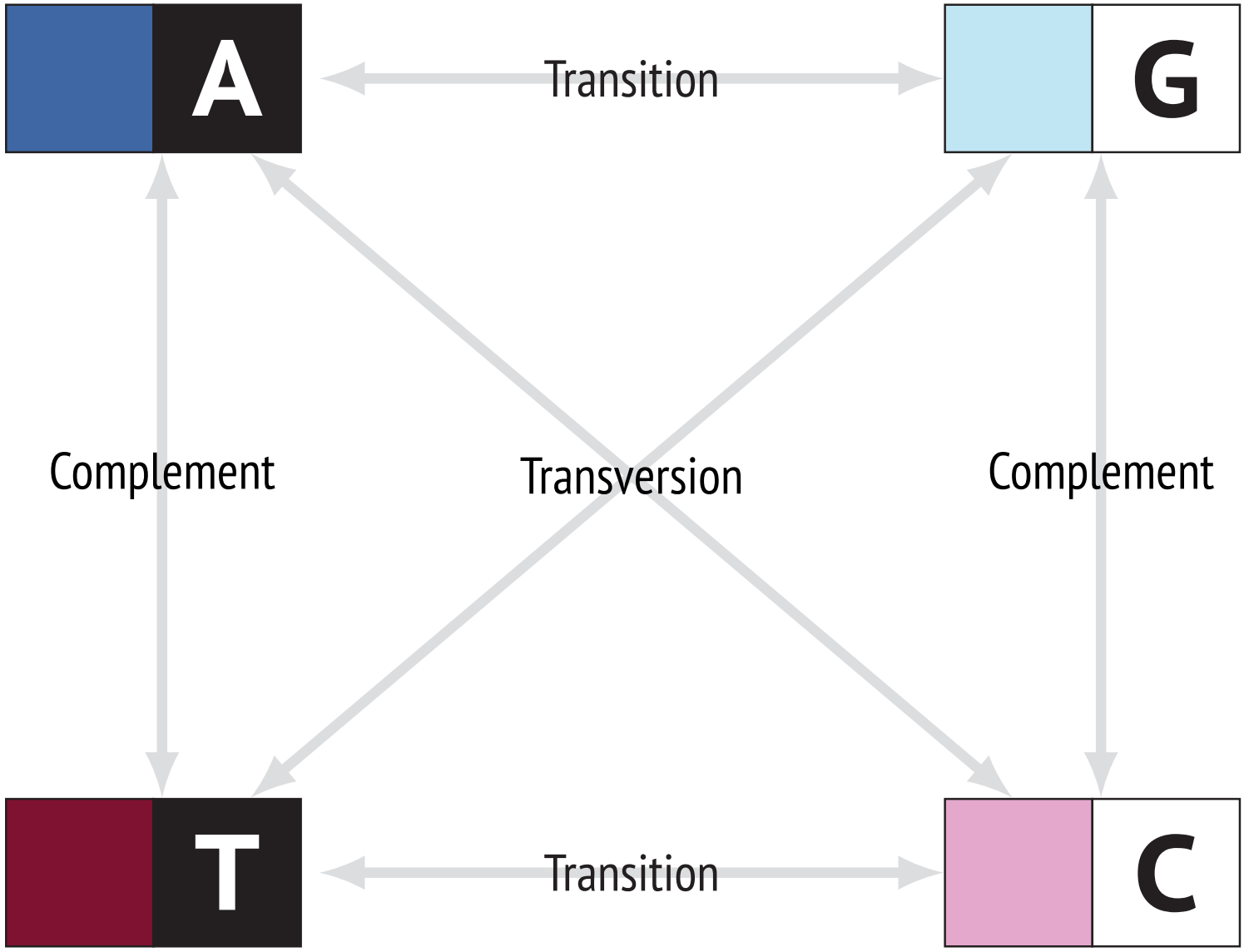
Amino

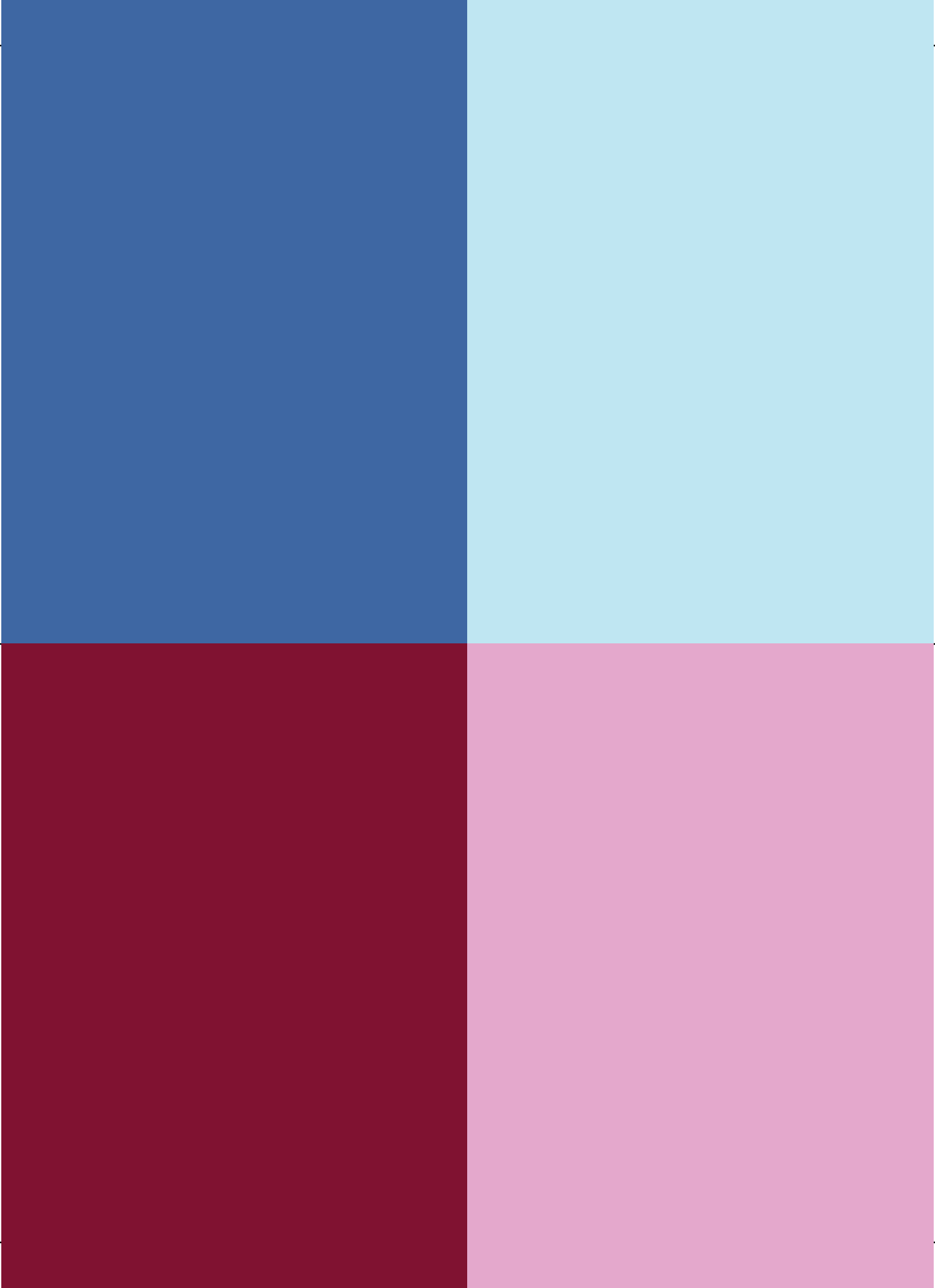


Not T

Not C

Any

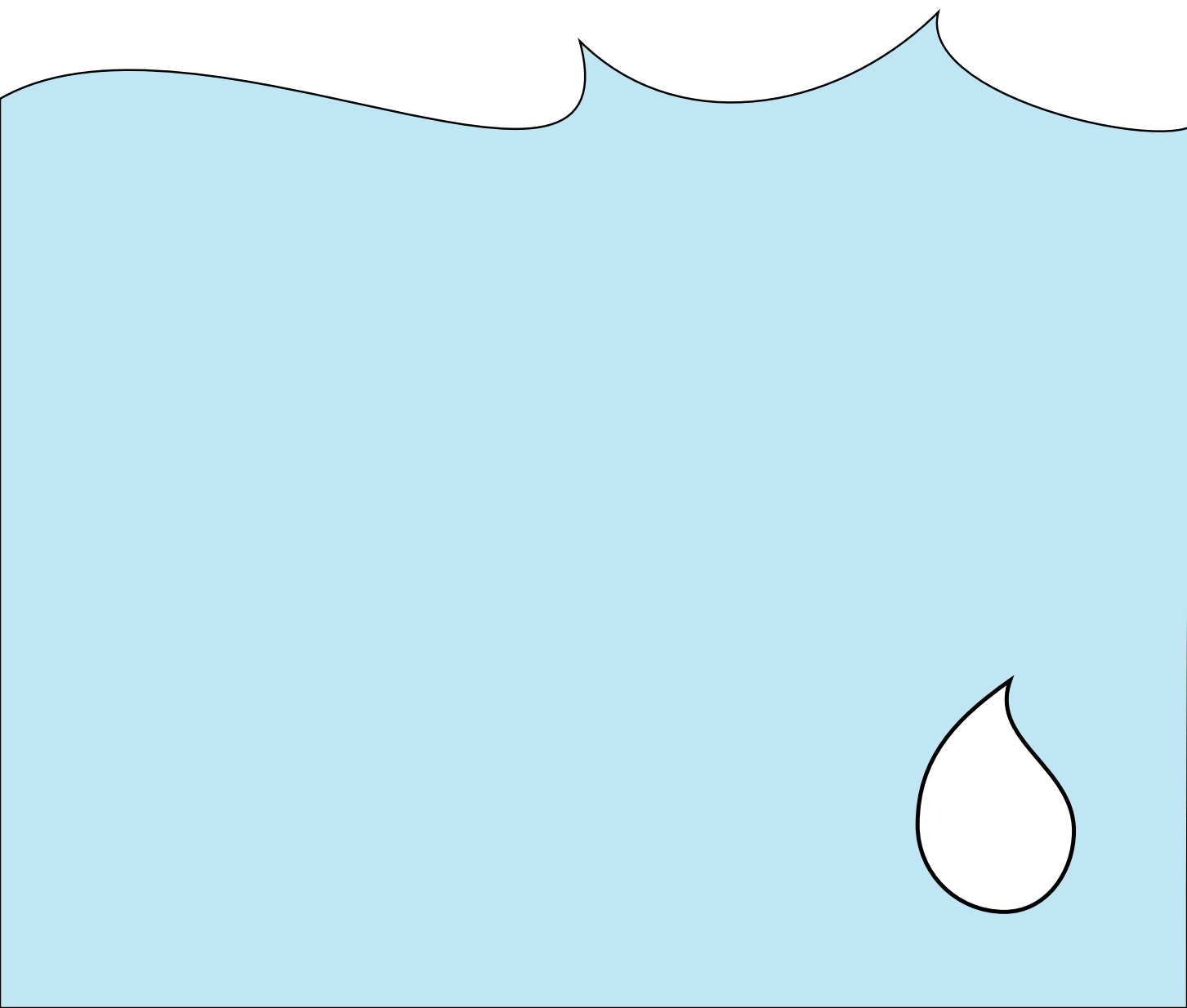

A
Transition
G
Complement
Transversion
Complement
T
Transition
C



Toggle Water ON/OFF

Buy: 0

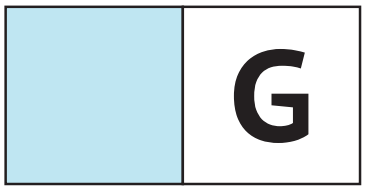
Use: 1

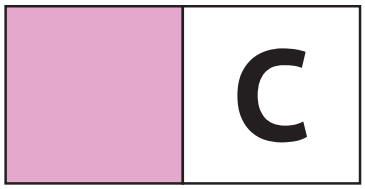


Extend

Buy: 0

Use: 1





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

Delete

Buy: 2

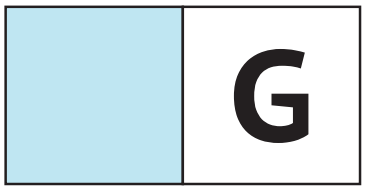
Use: 1

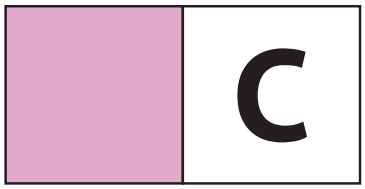
Delete any nucleotide
in the sequence.

Insert

Buy: 3

Use: 1



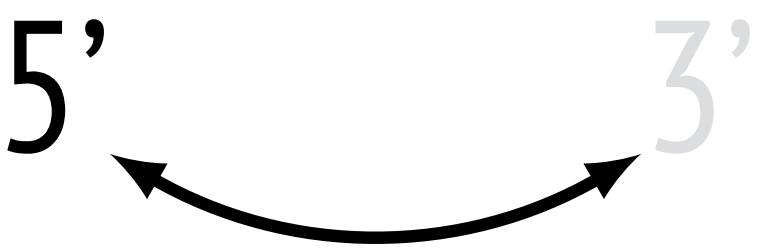


Roll the die to
insert a random
nucleotide anywhere
in the sequence.

Reverse Complement

Buy: 3

Use: 1

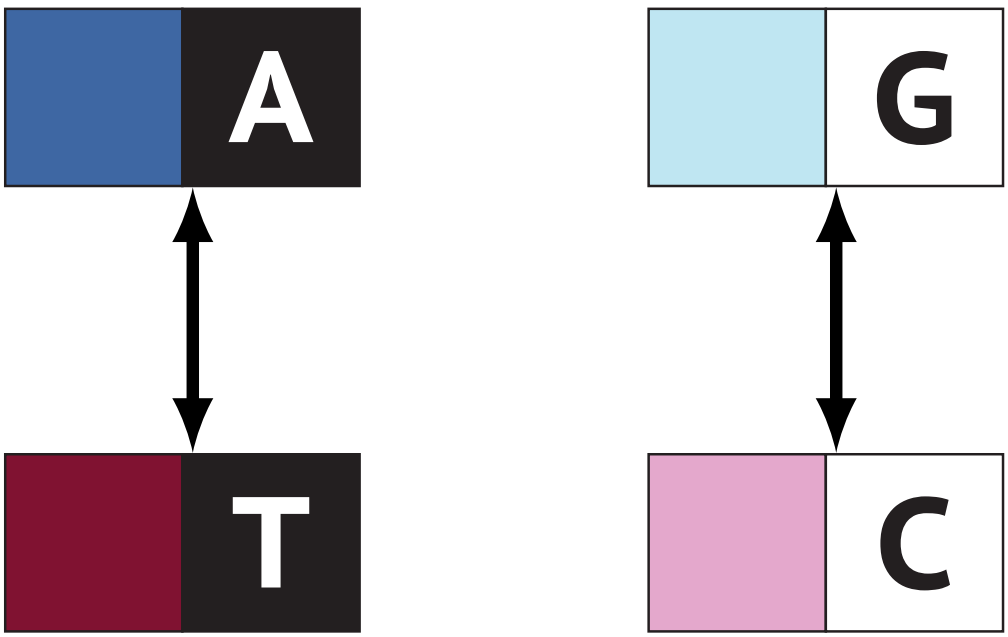


Swap the 5’ and 3’ ends to read the sequence in the opposite direction on the opposite strand.

Complement

Buy: 3

Use: 2

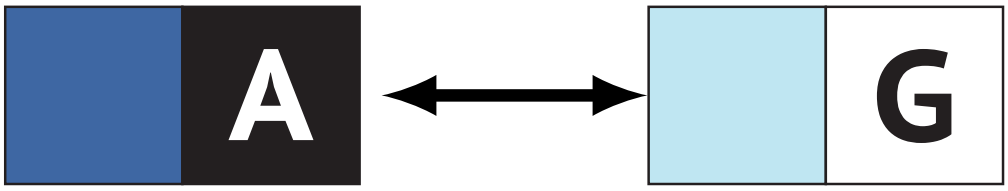


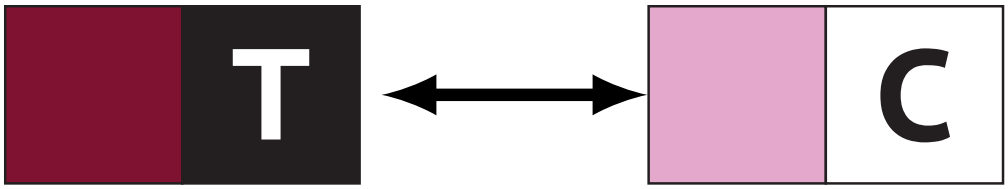
Rotate
any nucleotide
180 degrees.

Transition

Buy: 3

Use: 2



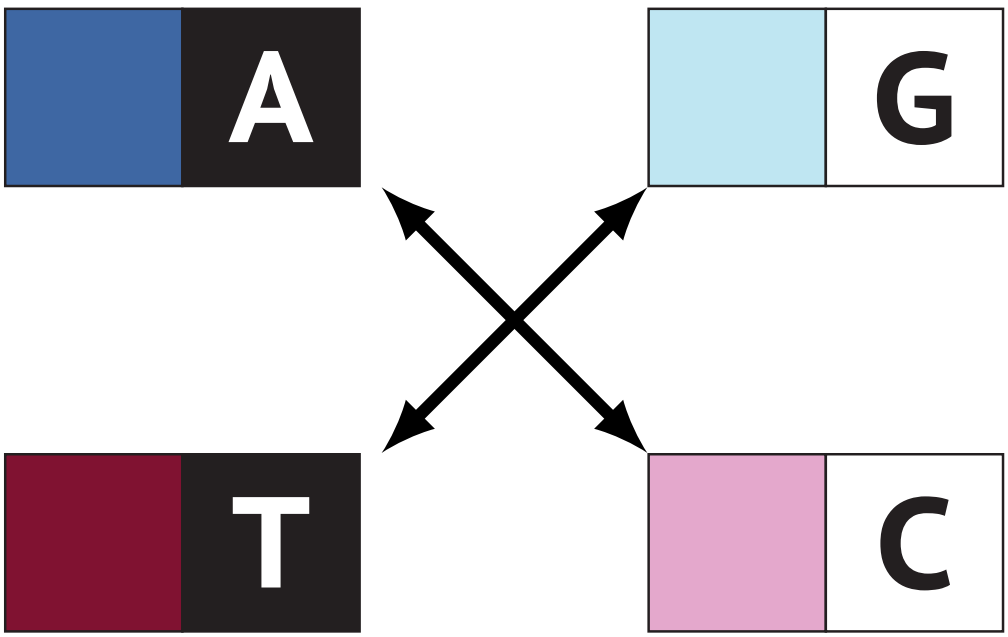


Flip
any nucleotide
horizontally.

Transversion

Buy: 3

Use: 2

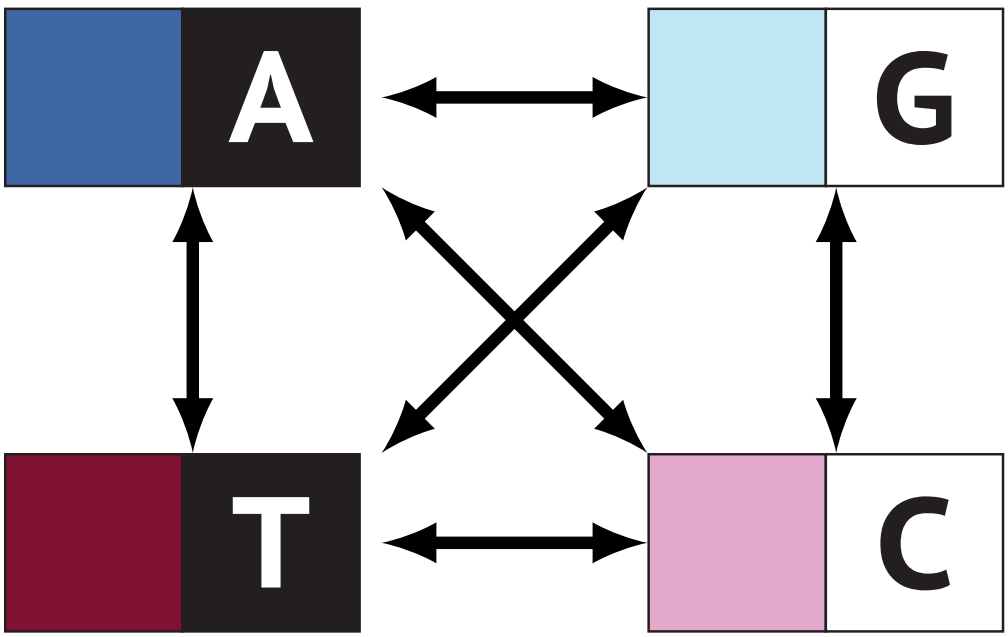


Flip
any nucleotide
vertically.

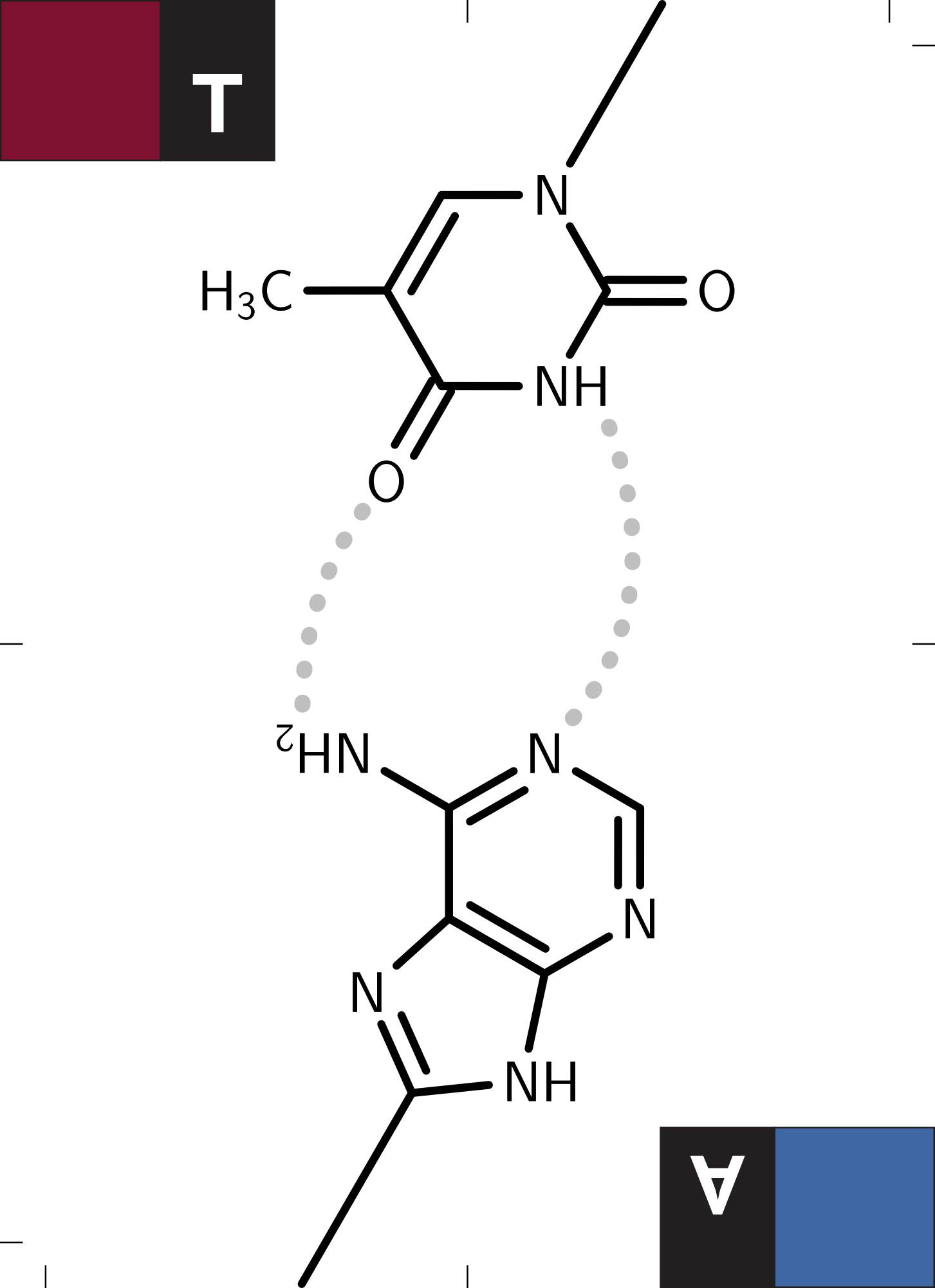
Mutate

Buy: 5

Use: 3

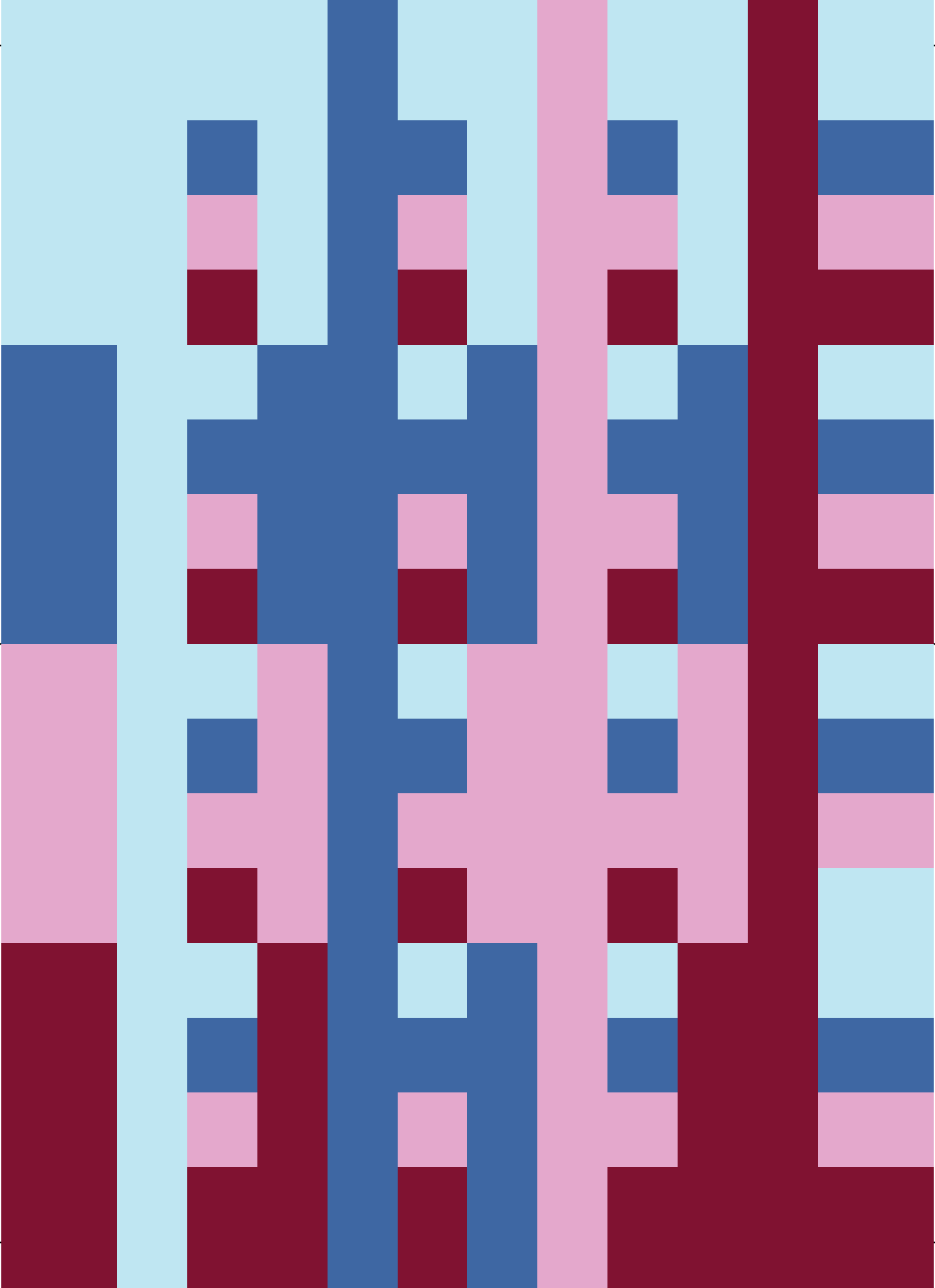


Rotate or Flip
any nucleotide
in any direction.


T
N
H3C
O
NH
O
H2N
N
N
N
NH
A

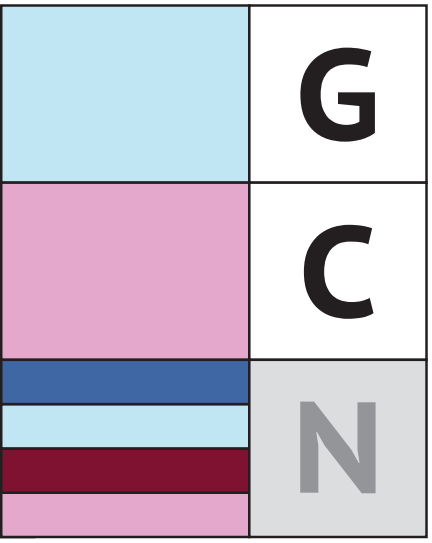
C

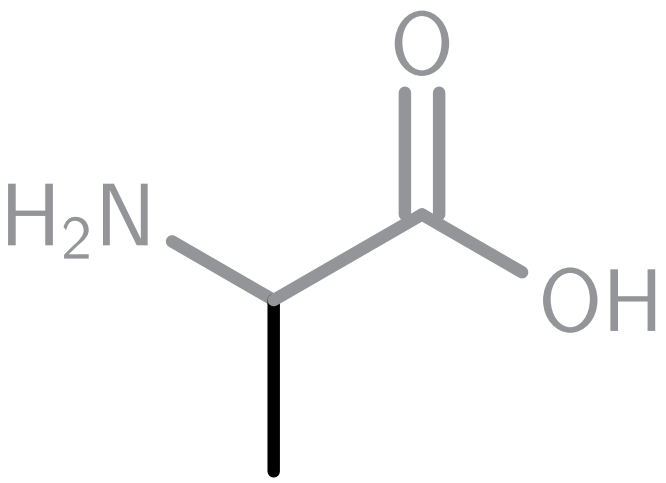
G



A Ala

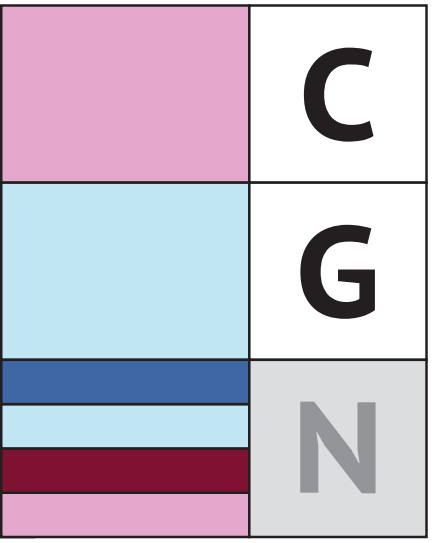
Alan Alanine

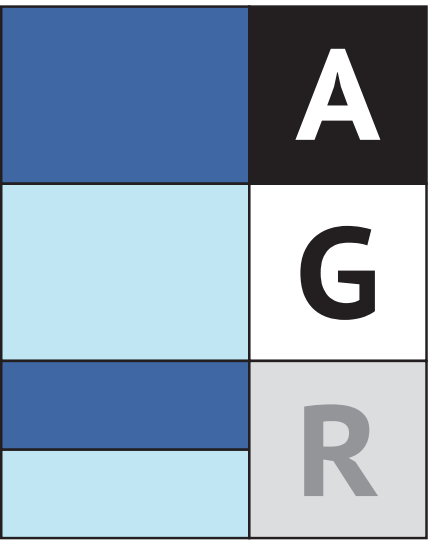


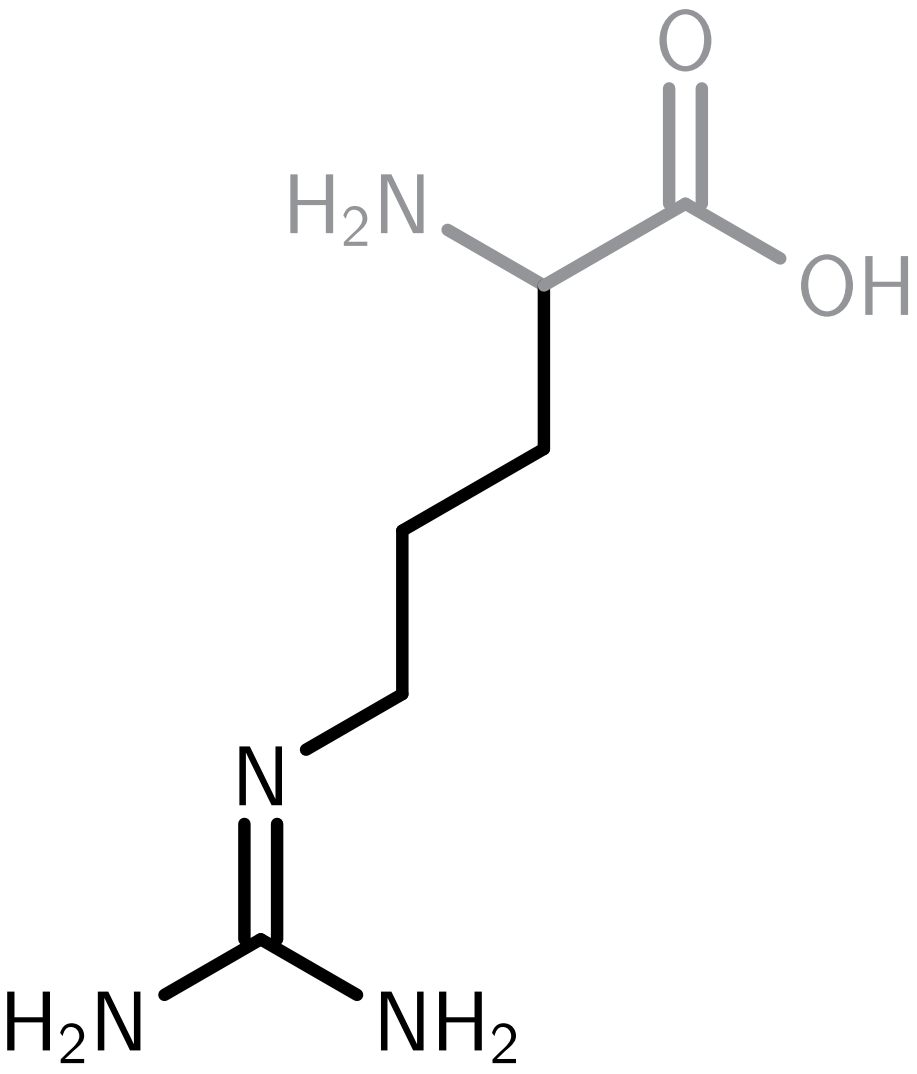


Aliphatic

R Arg Redbeard Arginine



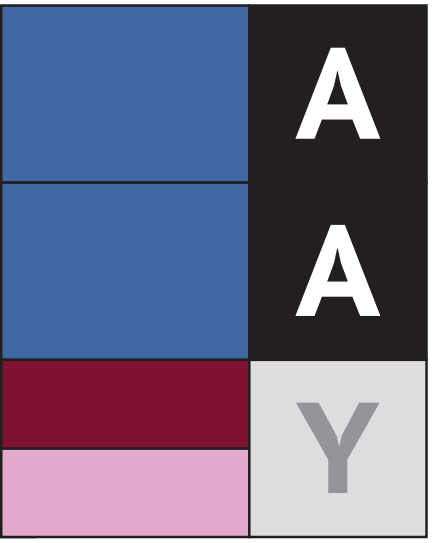


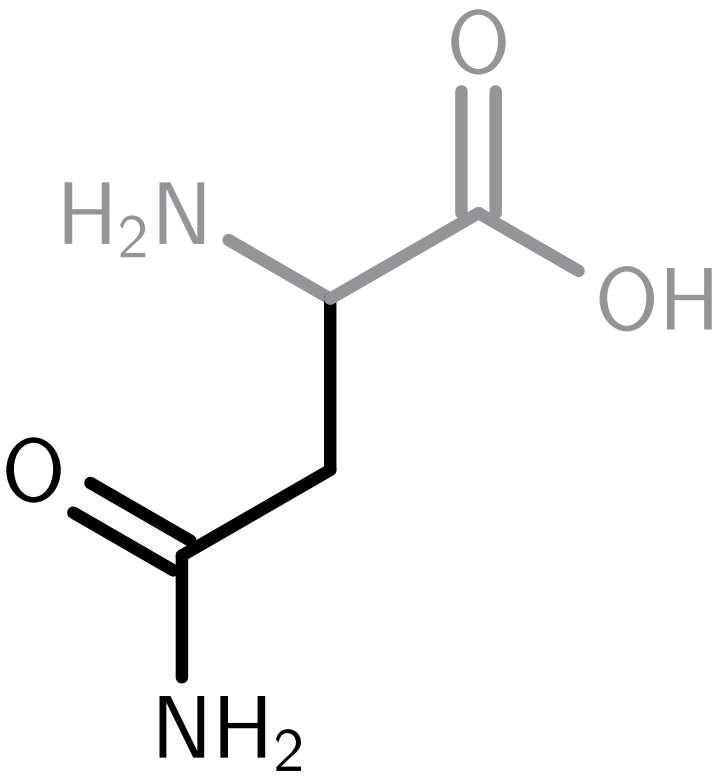


Basic ⊕

N Asn

Nancy Asparagine



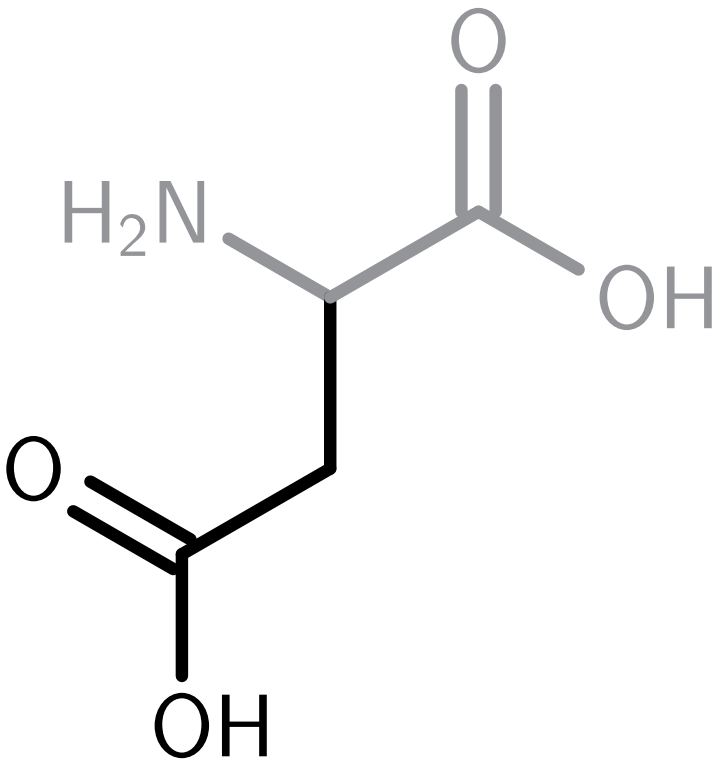


Small Polar

Acid Deriv. N

D Asp

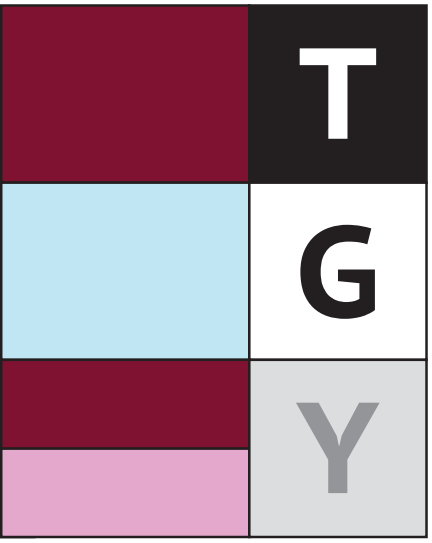
Devin Aspartate

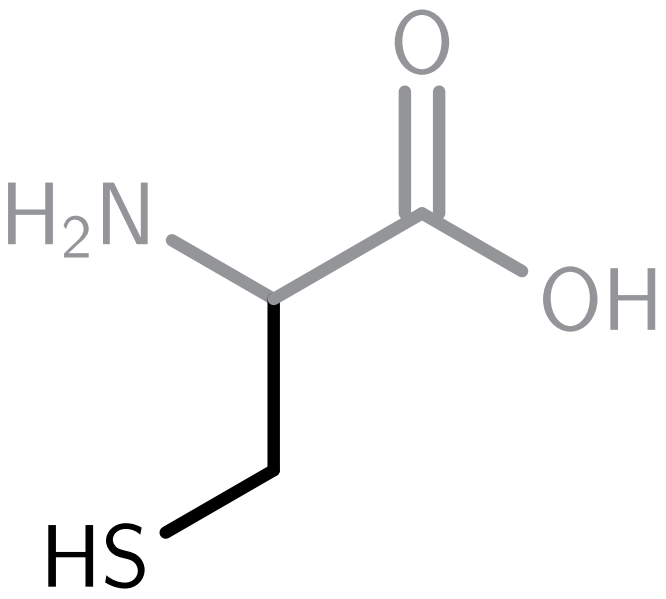


Acidic ⊖

C Cys

Cy Cysteine



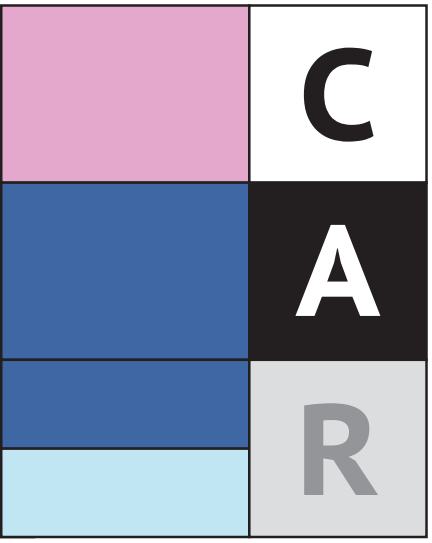


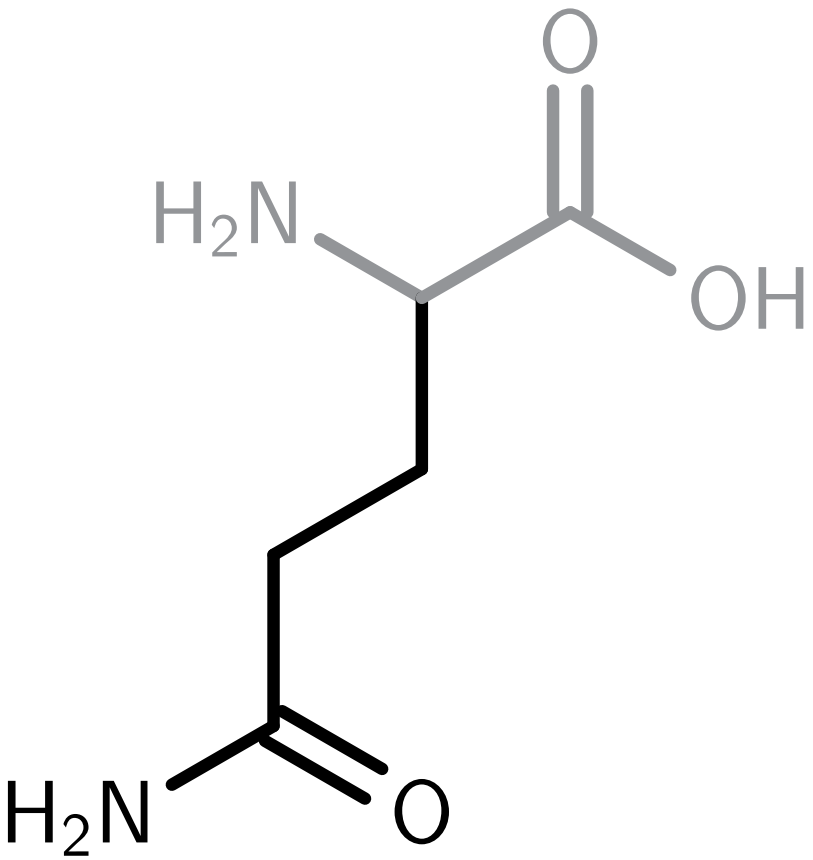
Small Polar

Sulfur

Q Gln

Queen Glutamine

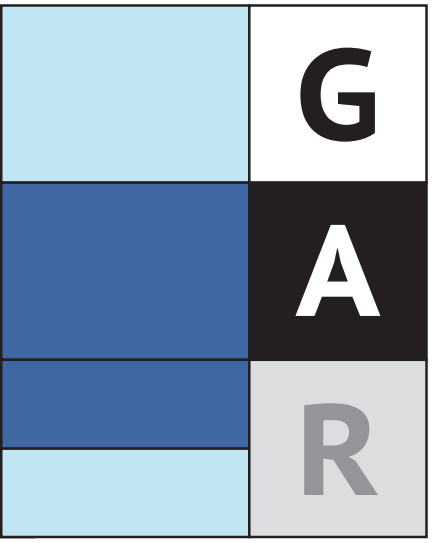


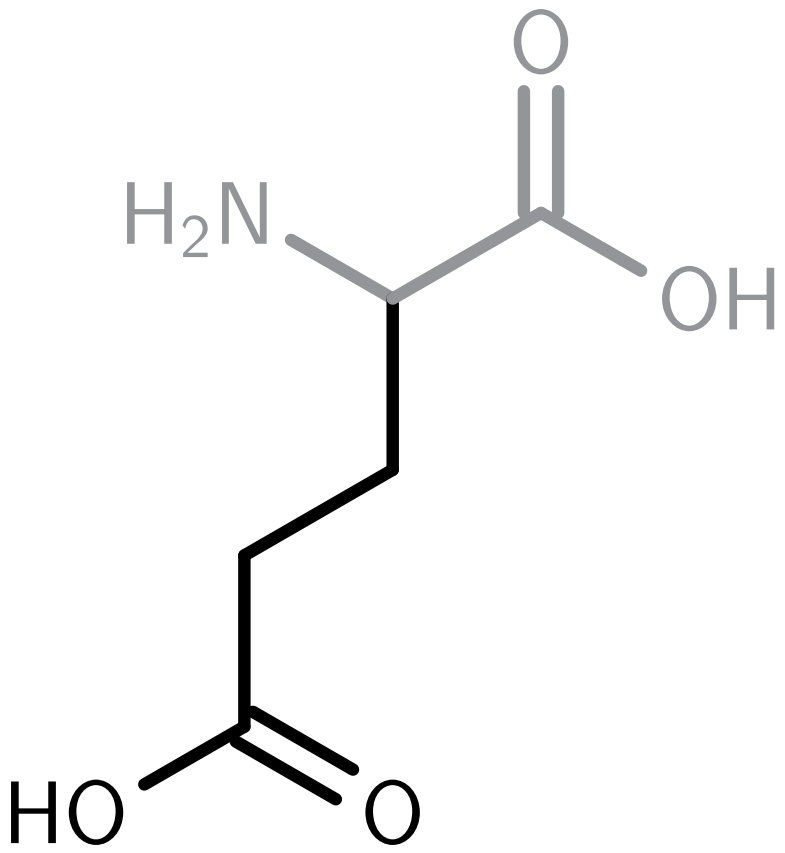


Acid Deriv. (N)

E Glu

Edwin Glutamate

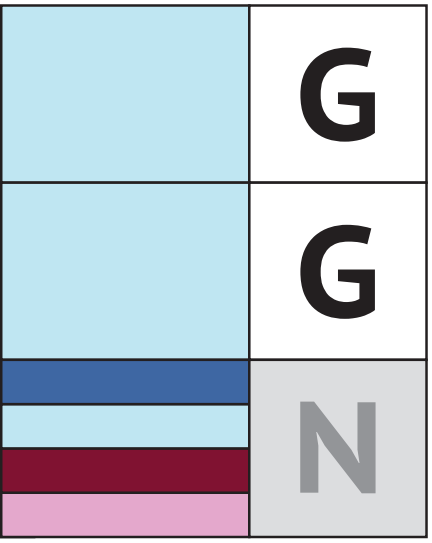


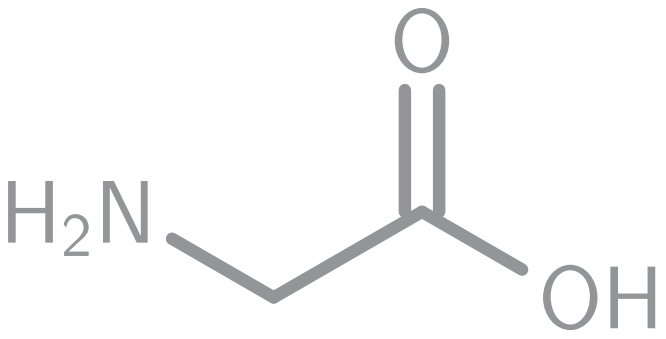


Acidic ⊖

G Gly

Gladys Glycine

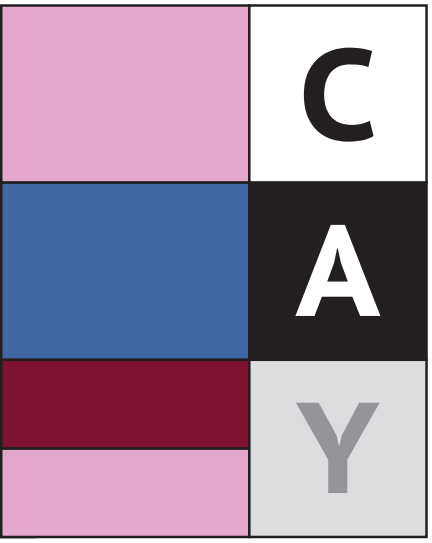


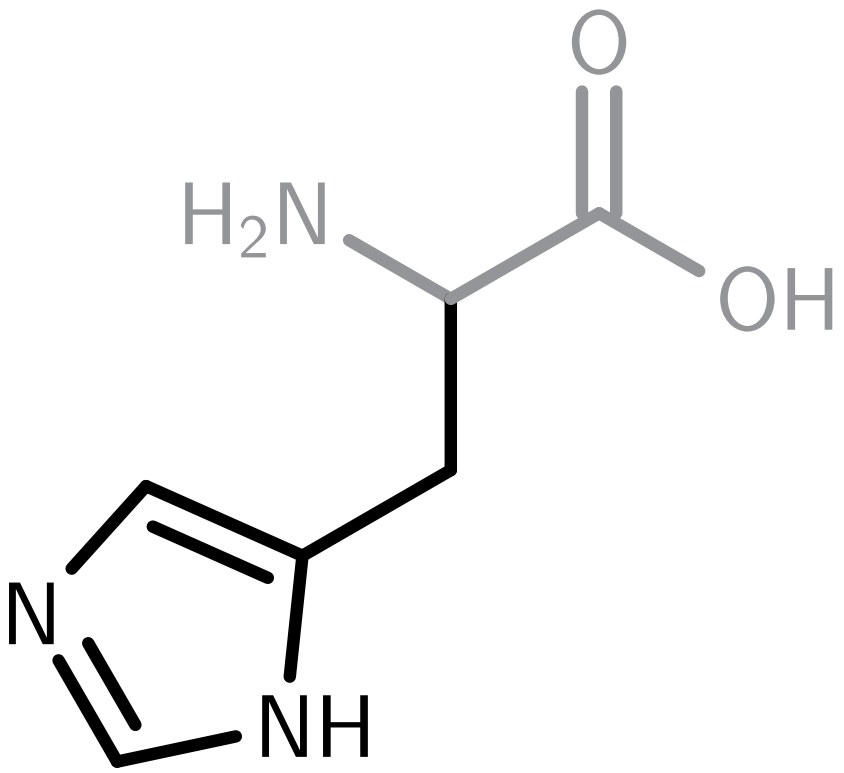


Unusual

H His

Hillary Histidine



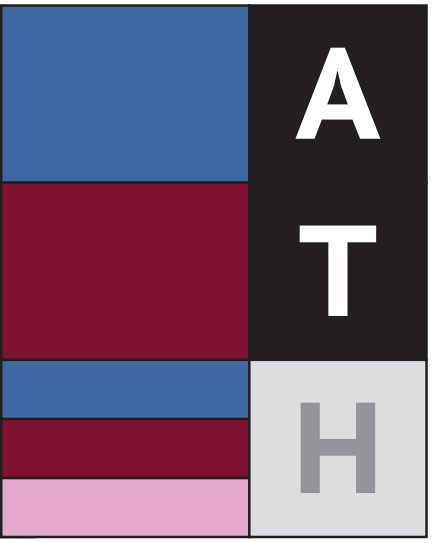


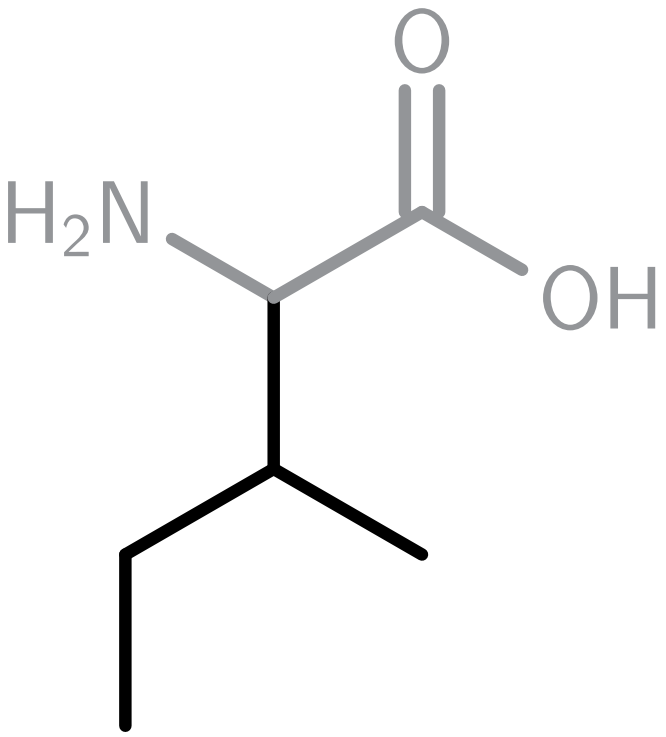
Aromatic

Basic ⊕

I Ile

Isa Isoleucine

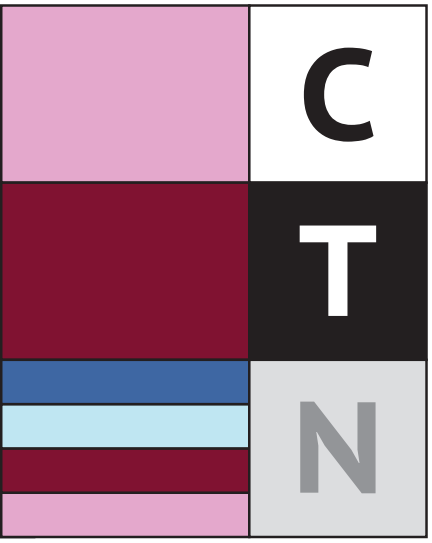


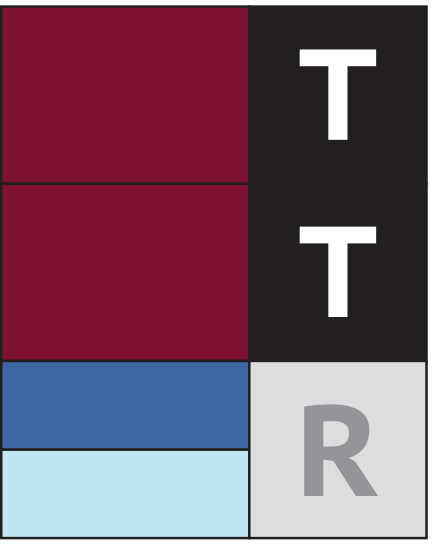


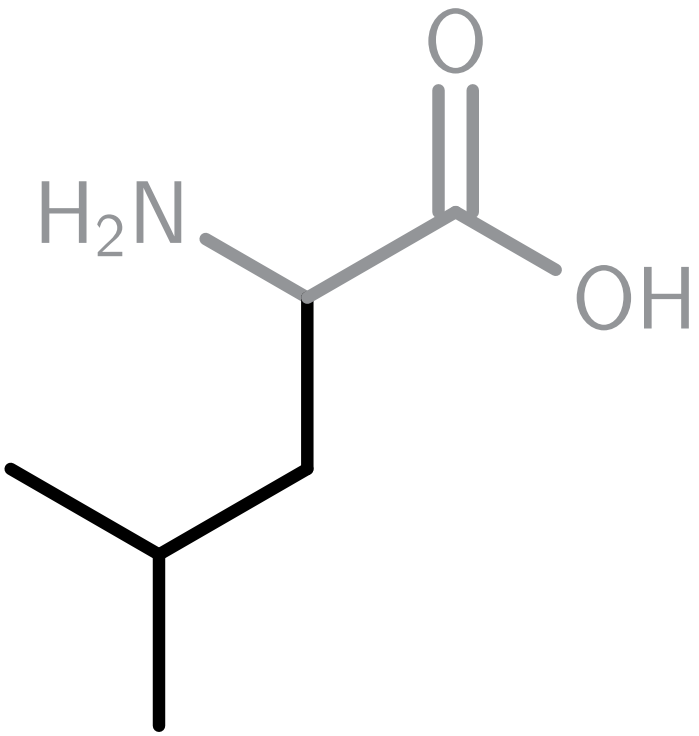
Aliphatic

L Leu

Lucy Leucine



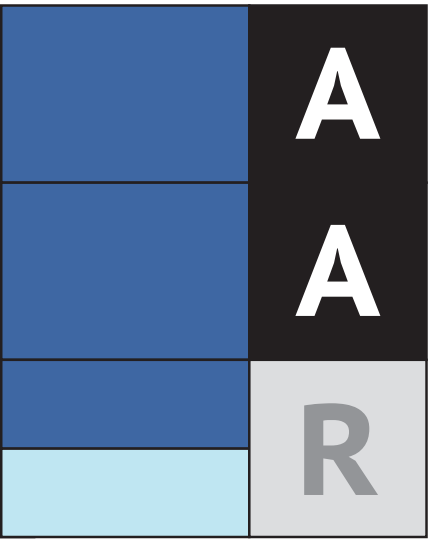


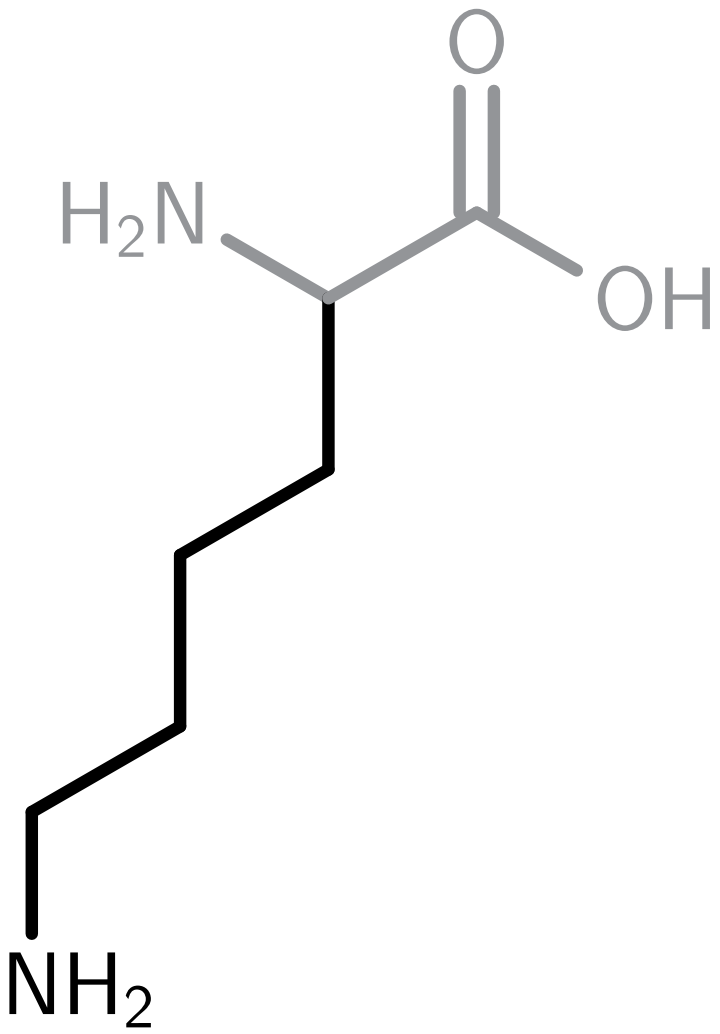


Aliphatic

K Lys

King Lysine

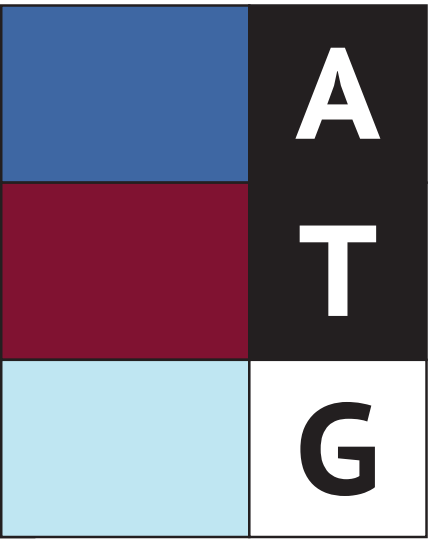


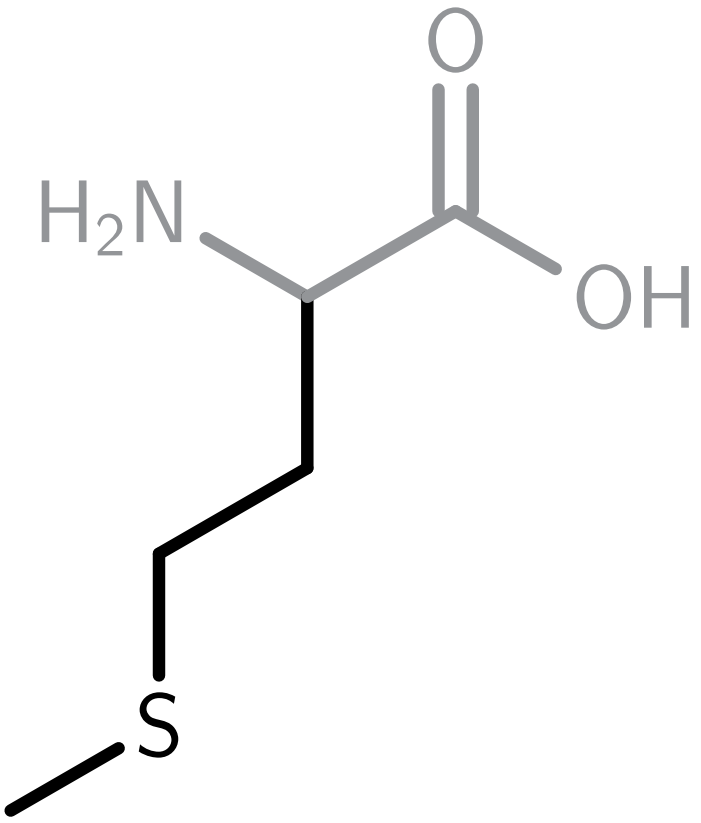


Basic ⊕

M Met

Matt Methionine

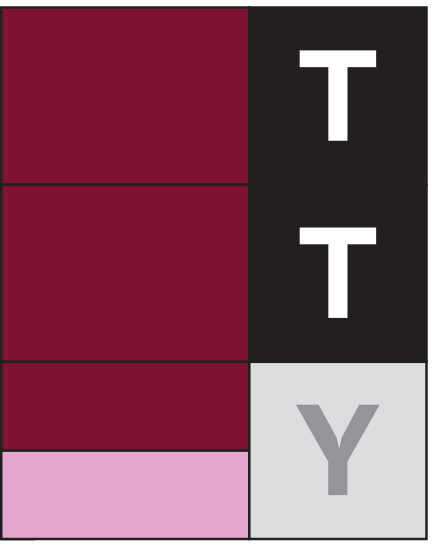


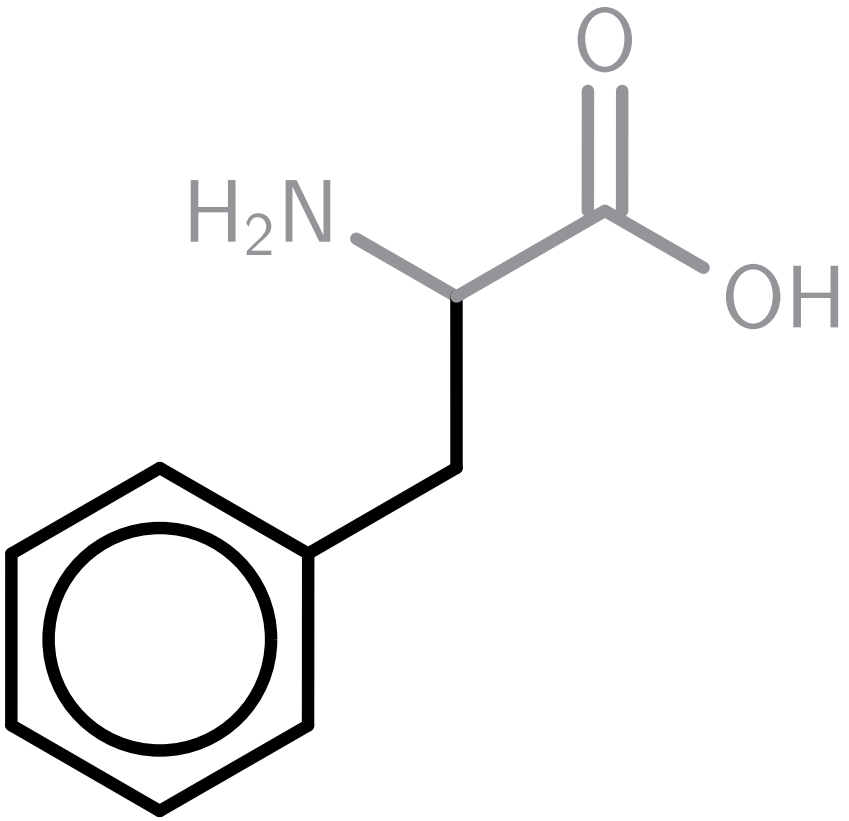


Sulfur

Aliphatic

F Phe Fred Phenylalanine

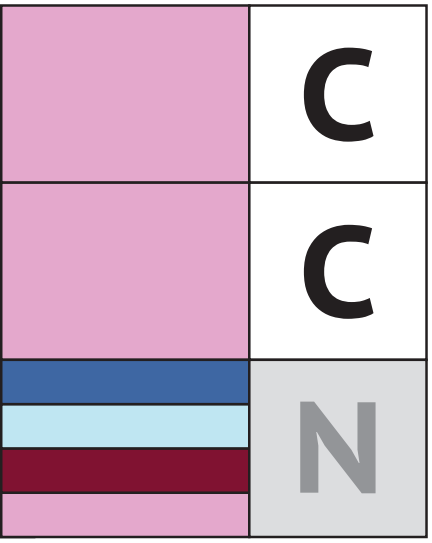


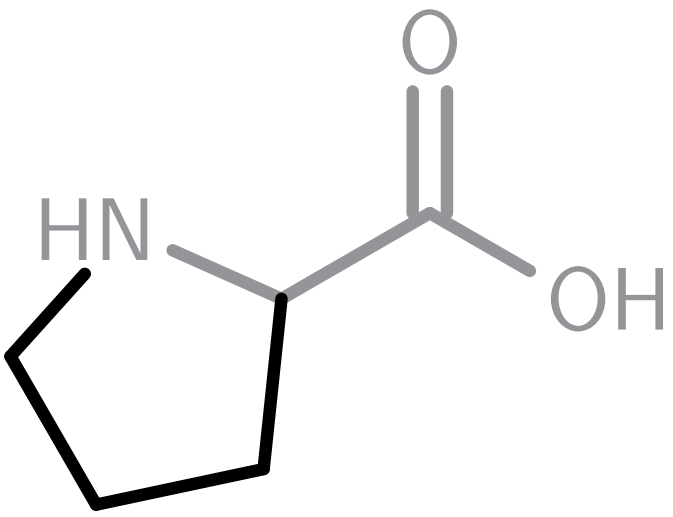


Aromatic

P Pro

Paul Proline

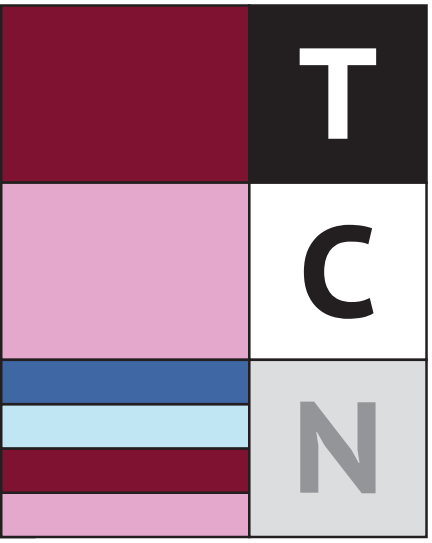


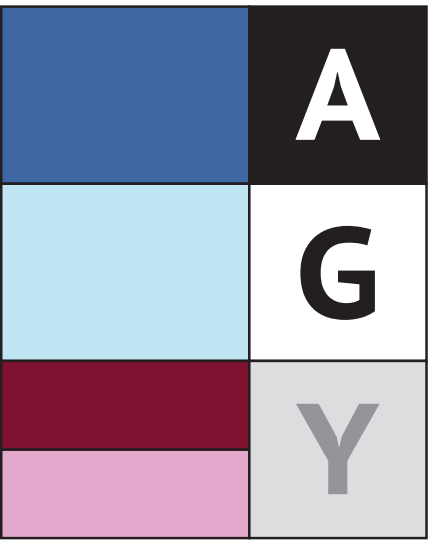


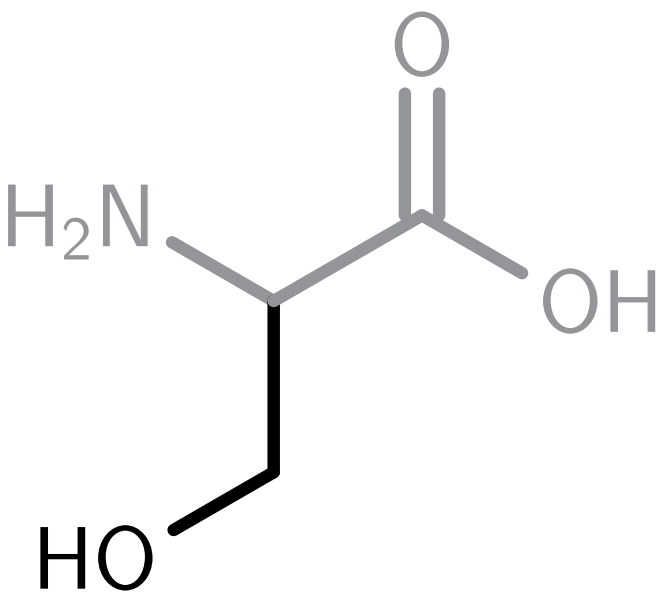
Unusual

S Ser

Sarah Serine



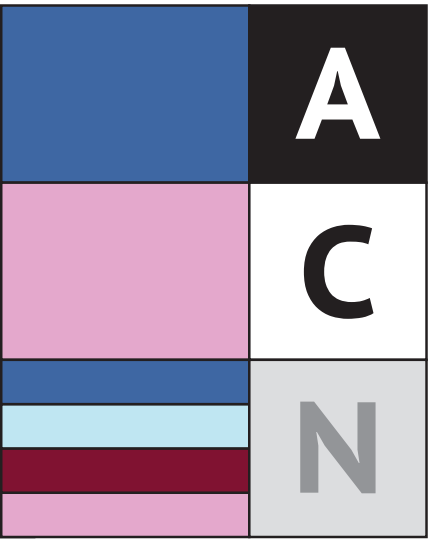


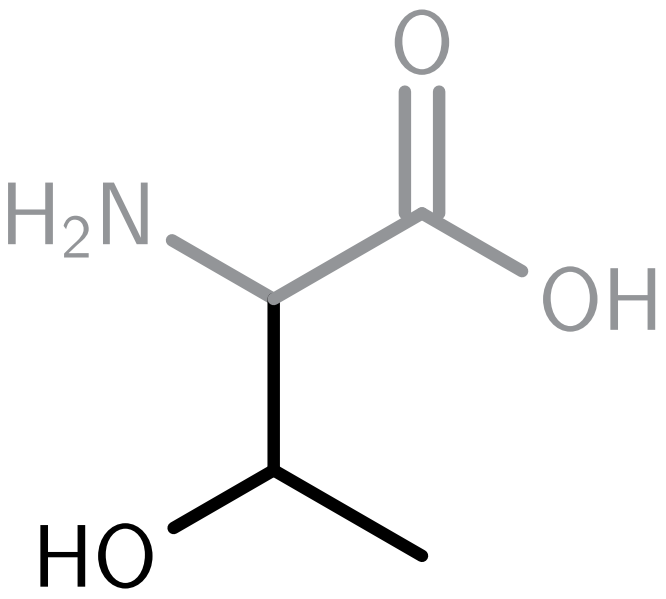


Small Polar

T Thr

Thor Threonine

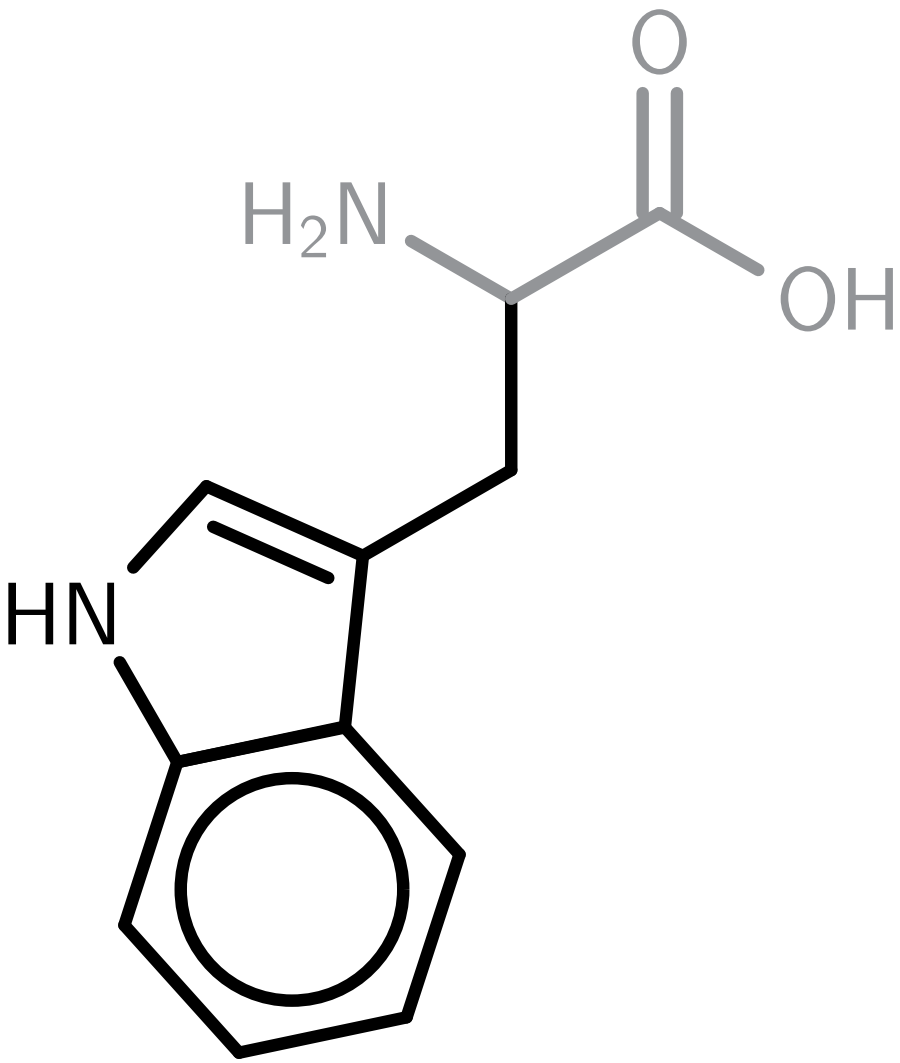




Small Polar

W Trp Wendy Tryptophan

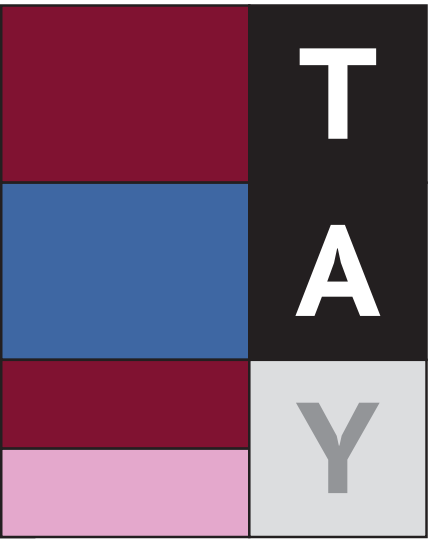
	T
	G
	G

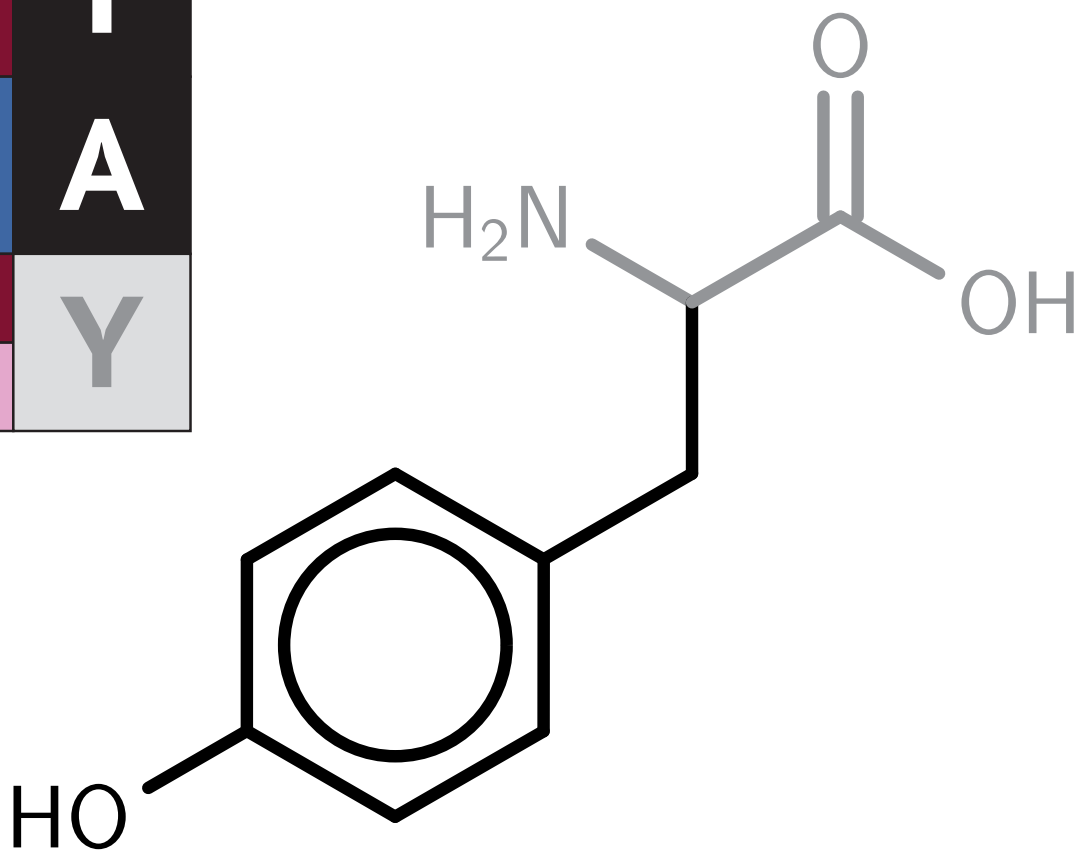


Aromatic

Y Tyr

Yvonne Tyrosine

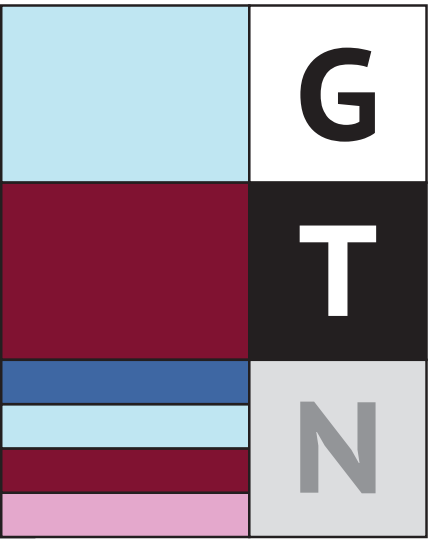


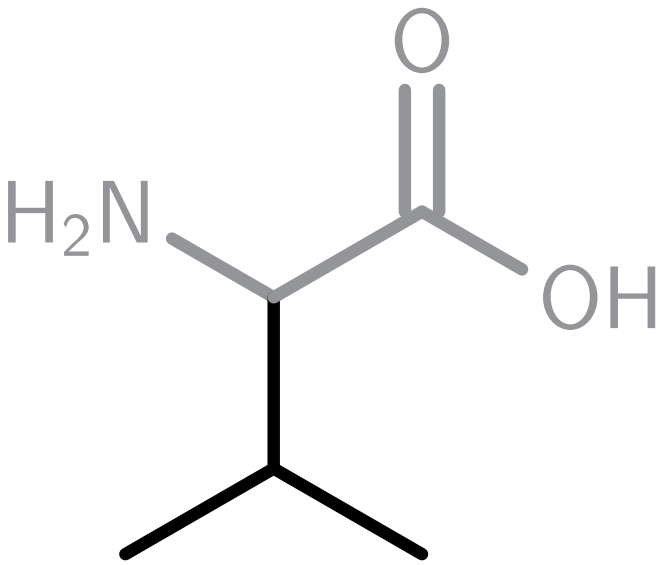


Aromatic

V Val

Valerie Valine





Aliphatic