

Table 1. Evolution of the Genetic Code

The GNC primitive genetic code
[4 codons]

| | | | | | |
|----------|----------|----------|---------------|-------------------|----------|
| | U | C | A | G | |
| G | Alanine | Alanine | Aspartic acid | Serine or Glycine | C |

| | | | | | |
|----------|----------|----------|---------------|-------------------|----------|
| | U | C | A | G | |
| G | Valine | Alanine | Aspartic acid | Serine or Glycine | C |



The SNS primitive genetic code [16 codons]

| | U | C | A | G | |
|---|--------|---------------|---------------|---------------|---|
| G | Valine | Alanine | Aspartic acid | Serine | C |
| | | | Glumatic acid | Glumatic acid | G |
| C | Valine | Glumatic acid | Glumatic acid | Glumatic acid | C |
| | | | | | G |

(Di Giulio 2008)

| | U | C | A | G | |
|---|---------|---------|---------------|----------|---|
| G | Valine | Alanine | Aspartic acid | Glycine | C |
| | | | Glumatic acid | | G |
| C | Leucine | Proline | Histidine | Arginine | C |
| | | | Glutamine | | G |

(Ikehara 2002)

The universal genetic code
[64 codons]

| | | | Second letter | | | | | | | | |
|----------------|----------|----------|---------------------------------|---------------------------------------|------------------------------------|--|-------------------------------------|-------------------------------------|--------------|--------------------------------------|------------------|
| | | | U | C | A | G | | | | | |
| Universal code | SNS code | GNC code | First letter | G | Valine GUU GUC GUA GUG | Alanine GCU GCC GCA GCG | Aspartic acid GAU GAC | Glycine GGU GGC GGA GGG | Third letter | | |
| | | | | | | | Glutamic acid GAA GAG | | | | |
| | | | | | C | Leucine CUU CUC CUA CUG | Proline CCU CCC CCA CCG | Histidine CAU CAC | | Arginine CGU CGC CGA CGG | U C A G |
| | | | | | | | | Glutamine CAA CAG | | | |
| | | A | Isoleucine AUU AUC AUA | Threonine ACU ACC ACA ACG | Asparagine AAU AAC | Serine AGU AGC | U C | | | | |
| | | | Methionine AUG (start codon) | | Lysine AAA AAG | Arginine AGA AGG | A G | | | | |
| | | U | Phenylalanine UUU UUC | Serine UCU UCC UCA UCG | Tyrosine UAU UAC | Cysteine UGU UGC | U C | | | | |
| | | | Leucine UUA UUG | | (stop codon) UAA UAG | (stop codon) UGA Tryptophan UGG | A G | | | | |