**Table 4.** 20 Primary amino acids in the Genetic Code and their corresponding numerical codons

|  |  |  |  |
| --- | --- | --- | --- |
| 1-Letter Abbreviation | 3-Letter Abbreviation | Amino Acid | Numerical Codons |
| A  B  C  D  E  F  G  H  I  J  K  L  M  N  O  P  Q  R  S  T  U  V  W  X  Y  Z | Ala  —  Cys  Asp  Glu  Phe  Gly  His  Ile  **Stop**  Lys  Leu  **Met (Start)**  Asn  —  Pro  Gln  Arg  Ser  Thr  —  Val  Trp  **Stop**  Tyr  **Stop** | Alanine  —  Cysteine  Aspartic acid  Glutamic acid  Phenylalanine  Glycine  Histidine  Isoleucine  **Opal**  Lysine  Leucine  **Methionine**  Asparagine  —  Proline  Glutamine  Arginine  Serine  Threonine  —  Valine  Tryotophan  **Ochre**  Tyrosine  **Amber** | 421, 422, 423, 424  —  141, 142  431, 432  433, 434  111,112  441, 442, 443, 444  231, 232  311, 312, 313  143  333, 334  113, 114, 211, 212, 213, 214  314  331, 332  —  221, 222, 223, 224  233, 234  241, 242, 243, 244, 343, 344  121, 122, 123, 124, 341, 342  321, 322, 323, 324  —  411, 412, 413, 414  144  133  131, 132  134 |