

cendog

CENDOG

WE are replicating the Central Dogma of biology.

```
library(cendog)
```

Generate a Random DNA Sequence

```
N <- 1000
DNA_seq <- gen_seq(N)
DNA_seq
#> [1] "TGGGTCATTACACAGTAGGAACTGCTTTTGGGCTAGATGTCGGGGACAATGTAGCCCATAGTGCCAATGAGTTATCACCGCTTTCCTTCTCGCAC"
```

Transcription

```
RNA_seq <- substi_T_U(DNA_seq)
RNA_seq
#> [1] "UGGGUCAUUACACAGUAGGAACUGCUUUUGGGCUAGAUGUCGGGGACAAUGUAGCCCAUAGUGCCAAUGAGUUAUCAACCGCUUCCUUCUCGCAC"
```

Split into Codons

```
codons <- split_to_codons(RNA_seq)
codons
#> [1] "UGG" "GUC" "AUU" "ACA" "CAG" "UAG" "GAA" "CUG" "CUU" "UUG" "GGC" "UAG" "AUG" "UCG" "GGG" "ACA"
#> [19] "CCC" "AUA" "GUG" "CCA" "AUG" "AGU" "UAU" "CAC" "CGC" "UUU" "CCU" "UCU" "CGC" "ACU" "CUA" "AGA"
#> [37] "CCU" "CCC" "UCU" "AGG" "GGU" "CAG" "CGC" "AUG" "UGG" "UGU" "GGC" "AUA" "CGG" "AUA" "UUU" "UAG"
#> [55] "AUG" "GUU" "GUU" "AAC" "GAU" "UAU" "UAG" "CAG" "CCA" "AGA" "CCG" "UGG" "GGU" "UUU" "GAC" "GGA"
#> [73] "ACG" "GCU" "AUU" "UAC" "AGC" "AGG" "UUG" "UUU" "AAU" "CUA" "UUC" "UCC" "ACA" "AAG" "AGA" "GUC"
#> [91] "GGC" "GCC" "GCU" "CAA" "CGG" "AAA" "AAG" "CUC" "UCG" "CCG" "AUA" "UUU" "GCA" "AGC" "AAC" "UUG"
#> [109] "CGC" "CAA" "GCG" "GCG" "UGU" "AUC" "CUC" "UGG" "UUG" "AUC" "GCU" "UAC" "GGU" "AAG" "AGU" "CCA"
#> [127] "GCG" "UGG" "CGA" "CAG" "ACU" "GCU" "AGU" "AGC" "GGC" "CAA" "GUG" "UAA" "UUG" "CCC" "CAG" "AUC"
#> [145] "ACA" "AAU" "GUU" "UGA" "GGU" "GCC" "GUU" "AAC" "CAU" "CGU" "CAC" "CGG" "GCA" "UUG" "CUU" "GGC"
#> [163] "GAU" "AUU" "AUU" "AGC" "GCC" "GCG" "UCG" "UUC" "GCU" "GGC" "UCU" "AUA" "UAC" "AGU" "CAC" "CAG"
#> [181] "CGA" "UGA" "CGU" "AUU" "ACC" "GCU" "UUC" "CGA" "ACU" "UAG" "CUU" "CUU" "CAC" "AAU" "GAU" "GAC"
#> [199] "UGC" "AUG" "GGA" "GCC" "GCC" "AAU" "UAG" "GCA" "UGU" "CCG" "AGU" "GGC" "UCU" "CAA" "UAG" "ACG"
#> [217] "AUA" "GCG" "GAA" "AGA" "ACG" "CUU" "AGA" "GAG" "UUU" "AAA" "GGC" "ACU" "GUU" "GGG" "CGA" "ACA"
#> [235] "CCC" "UUC" "UAC" "UAG" "UGU" "CCC" "AUG" "CGA" "GGU" "UCA" "GAU" "CAU" "GUA" "CUU" "ACG" "AGA"
#> [253] "GUC" "AUU" "ACC" "CUA" "GUA" "GUU" "CGA" "CAU" "CUG" "UUA" "GUU" "UGA" "CUG" "GGC" "GCU" "UCU"
```

```
#> [271] "GUA" "GCC" "AUC" "CGA" "UAC" "UUA" "AAC" "CCC" "GUU" "ACU" "AAG" "AUU" "CGA" "UGG" "CUU" "GAG"
#> [289] "AGG" "GCA" "AGA" "CAU" "GAG" "UUU" "CCU" "UCU" "GCG" "ACU" "CCG" "AGG" "GAG" "GGA" "UUU" "ACA"
#> [307] "UCA" "AAC" "CGC" "CUU" "GCC" "GGU" "CUC" "UUG" "GGC" "UGA" "CGA" "CGC" "GCA" "AAC" "GAA" "UUC"
#> [325] "UGU" "AAA" "ACA" "GUG" "UUG" "AGC" "CAG" "GGU" "GUA"
```

Translation

```
aa_seq <- translation(codons)
aa_seq
#> [1] "WVITQ_ELLLG_MSGTM_PIVPMSYHRFPSRTLINPPSRGQRMWCGIRIF_LTMVVNDY_QRPWGFDE_TAIYSRLFNLFSTKR VVGAAQR"
```

Visualisation

```
plot_amino_acid_composition(aa_seq)
```

