Solutions to 7.012 Central Dogma Problems

Prokaryotic Gene (β-galactosidase)

a) 5' AAUUGUGAGC.....3'

b) H_3N^+-met-ser-his-arg-lys-...COO⁻

c) No, becuase it is read out of frame; it is read as: C**UA**, **A**GA

d) H_3N^+-met-ser-**thr-gly-asn-.....**COO⁻

e) H_3N^+-met-ser-his-**lys**-**glu**-...COO⁻

f) No change, silent mutation

g) Delete 1 or add 2 after AUG and before the TAA (and do not make another in-frame stop).

h) UGG (trp) ---> UGA (stop)

i) AGG (arg) ---> GGG (gly)

j) AGG (arg) ---> AGA (arg)

Eukaryotic Gene (con-6)

The structure of con-6 is shown below (numbers as in the genomic sequence).