



Effects of Mutations on Gene Expression

(Read 3' to 5' and build 5' to 3')

DNA template: 3' 5'
GATTACGTACCTAG

mRNA transcript: 5' 3'
CUAAAUGCAUGGAUC

amino acid chain:

leucine – asparagine – alanine – tryptophan – isoleucine

Effects of Mutations – Point Mutation

(Read 3' to 5' and build 5' to 3')

DNA template: 3' 5'
GAGTTACGTACCTAG

mRNA transcript: 5' 3'
CUCAAUGCAUGGAUC

amino acid chain:

leucine – asparagine – alanine – tryptophan – isoleucine

NO CHANGE

Effects of Mutations – Point Mutation

(Read 3' to 5' and build 5' to 3')

DNA template: 3' GATCTACGTACCTAG 5'

mRNA transcript: 5' CUAGAUGCAUGGAUC 3'

amino acid chain:

leucine – asparagine – alanine – tryptophan – isoleucine

leucine – aspartic acid – alanine – tryptophan – isoleucine

Effects of Mutations – Deletion (frame shift)

(Read 3' to 5' and build 5' to 3')

DNA template: 3' GATTTACGTACCTAG 5'
GATTTTCGTACCTAG ←

mRNA transcript: 5' CUAAAGCAUGGAUCC 3'

amino acid chain:

leucine – asparagine – alanine – tryptophan – isoleucine

leucine – lysine – histidine – glycine – serine

Effects of Mutations – Insertion (frame shift)

(Read 3' to 5' and build 5' to 3')

DNA template: 3' GATTTACGTACCTAG 5'
GATTTAACGTACCTAG →
GATTTAACGTACCTA

mRNA transcript: 5' CUAAAUUGCAUGGAUC 3'

amino acid chain:

leucine – asparagine – alanine – tryptophan – isoleucine

leucine – asparagine – cysteine – methionine – aspartic acid
