



Ingoa (name in Maori):

Insulin Protein Synthesis

I. Introduction:

This **summative lab activity** will require you all to have become proficient with the processes of **transcription** and **translation** in the pathway of making proteins from DNA (*Remember the central dogma of biology: DNA → RNA → Protein*). It will rely on the hard work you did in the: (1) interactive introduction to protein synthesis, (2) protein synthesis 3 station lab, and (3) self-check worksheet.

II. Materials:

DNA sequence for human insulin (chains A & B)
Tape & scissor/glue (if preferred)
Amino acid template sheets

Large paper to make your insulin poster
Markers/colored pencils
Chromebook

III. Directions:

You and your project partner (only two per group) will be given the sections of insulin DNA in a stapled packet. The DNA sections in the packet are in order from beginning to end so do not mix up this order. You can tape your insulin gene/DNA sequence master packet in order. Once you have fixed your DNA sections together, take the steps necessary to **follow the central dogma of biology and make your protein** (assume there was an AUG just before your gene and a UGA just afterward). You will be relying on all the hard work you did in the classes leading up to this lab, so all the information is at your fingertips! Do not share information or give other groups the answer to all your hard work!!

Once your DNA molecule has been assembled, there are spaces to write your **mRNA transcript** and the **amino acids** that it codes for. Once you have your amino acid sequence arranged, search for an image of “*human insulin amino acid sequence*” so you can correctly assemble your protein.

Color each amino acid a different color, or whatever creative way you’d like and tape your product to a larger format piece of paper. Include: (1) the title of the molecule, (2) members of the group, and (3) the major function(s) of this protein. Be specific!

IV. Scoring:

mRNA correctly formed (20) _____

Accurately presented functions (10) _____

Correctly coded protein (20) _____

Correctly researched protein structure presented (10) _____

Total _____ / **60** + _____ **bonus** = _____ / _____

Bonus 1: Super artistic/professional (10)

Bonus 2: describe a condition caused by an error in making this protein and explain the effect of this error (10)