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AP BIOLOGY RECOMBINANT PLASMID QUESTIONS

Where are restriction enzymes found in nature? What is their function?

What would happen if an enzyme was used that cut the plasmid at the replication site?

Why is it important to find an enzyme that only cuts at the plasmid DNA at one site? What would happen if the plasmid were cut at more than one site?

Why is it important to cut the plasmid and the human DNA with the same restriction enzyme?

Why is it important to find a restriction enzyme that will make two cuts in the human DNA, one on either side of the “insulin gene”?

Why would restriction enzymes that create “blunt” ends not be as useful in creating recombinant plasmids as those that create “sticky ends”?

Is Enzyme 9 a good choice to use to make your recombinant plasmid? EXPLAIN your answer.

Is Enzyme 6 a good choice to use to make your recombinant plasmid? EXPLAIN your answer.

Which restriction enzyme is the best to use to create a plasmid containing the human insulin gene?   
EXPLAIN WHY YOU CHOSE THIS ONE. What criteria are you using to decide which is the “best” to use?

Ask other groups which enzyme they used and compare the final transgenic plasmids.  
Why might there be some different lengths?

In this activity, you stimulated creating a recombinant plasmid. What do the scissors represent?

What does the tape represent?

Once you have created your recombinant plasmid, explain how it could be used to make human insulin.

Explain what happens to eukaryotic mRNA before it leaves the nucleus and is translated into a protein that is different than prokaryotic mRNA.

What problem does this create for scientists using human genes to create recombinant plasmids that make human products like insulin in bacteria?

What “trick” have scientists borrowed from retroviruses that gets around this problem?

Modified from: http://www.biologycorner.com/worksheets/DNA\_analysis.html