

WOW Biolab: Bacterial Transformation

McDougal Littell Virtual Biology Labs

https://www.classzone.com/books/hs/ca/sc/bio_07/virtual_labs/virtualLabs.html

Background: You have successfully engineered a recombinant bacterial plasmid, congratulations! Now it is time to transform it into the *E. coli* bacteria. In this computer simulation you will replace the scissors and tape with petri dishes, chemicals, thermal processes, and scientific equipment. As you complete the problem, record your protocol and results.

Problem: Because previous types of insulin production caused adverse reactions in patients, alternate production methods were necessary. Through the process of bacterial transformation, human insulin genes are inserted into *E. coli* bacterial cells. The transformed *E. coli* produce human insulin that can be used to treat patients with diabetes. In this investigation, you will transform the recombinant plasmids into *E. coli* and test for antibiotic resistance to prove your transformation was successful.

Materials	Use
<i>E. coli</i> bacteria	Source material
Tubes of CaCl ₂	Changes the cell wall to allow DNA to enter
<i>E. coli</i> plasmids with amp ^R	Recombinant DNA with ampicillin
Sterile pipette	To transfer plasmids to CaCl ₂
Ice water bath	Prevents <i>E. coli</i> from dividing while plasmids are taken in
Warm water bath	Will allow the bacteria more readily take in plasmids
Agar infused with ampicillin	Nutrient media with ampicillin
Agar not infused with ampicillin	Nutrient media
Sterile inoculating loops	To spread the bacteria onto the agar
Biohazard container	Safely dispose equipment
Incubator	Ideal temperature to grow bacteria
Sterile toothpicks	Transfer <i>E. coli</i> from stock to solution

Hypothesis:

Petri Dish	Growth (y/n)	Reasoning
#1: Control Agar with <i>E. coli</i> +amp ^R	Yes (most)	No antibiotic and resistance gene
#2: Agar + Ampicillin with <i>E. coli</i> +amp ^R	Yes	Antibiotic agar, but has resistance gene
#3: Control Agar with <i>E. coli</i> -amp ^R	Yes (most)	No antibiotic, no resistance gene
#4: Agar + Ampicillin with <i>E. coli</i> -amp ^R	No	Antibiotic and no resistance gene

Answers For Classzone Bacterial Transformation Lab

Marlene Kent



Answers For Classzone Bacterial Transformation Lab:

Advanced Biology Lab Investigations Marlene Kent, 2013-12-24 This manual contains 24 labs and is aligned with the first year college advanced placement level high school biology curriculum standards and science practices There are eight main lab investigations two for each AP Bio Big Idea each including a student guided inquiry 1 DIFFUSION AND OSMOSIS Surface area and cell size modeling osmosis in live water plant cells 2 CHANGES WITHIN POPULATIONS PTC taste test global analysis simulations of changes within populations Equilibrium Natural Selection Genetic Drift mathematical modeling of allele frequencies within a population 3 EVOLUTIONARY RELATIONSHIPS Cladogram construction biochemical analyses of gene and protein sequence % similarities and differences BLAST database tutorial and cladogram construction for comparing evolutionary relationships Entrez Gene database tutorial comparing normal gene sequences to chromosomal aberrations in human diseases 4 MITOSIS and MEIOSIS Loss of cell cycle control analysis in cancer cells using human karyotypes environmental abiotic effects on mitotic rates and data analysis for significance student guided inquiry on environmental effects on mitosis and crossing over in meiosis demonstrating increased genetic variability in subsequent generations 5 ENZYME ACTIVITY Catalase enzyme and breakdown of toxins in the liver enzyme specificity using lactase enzyme rates of reaction assay and baseline effects of pH on enzymatic activity and student guided inquiry for other potential environmental effects on enzyme activity 6 PHOTOSYNTHESIS AND CELLULAR RESPIRATION Predictions on effect of different abiotic conditions on photosynthesis and the effect of exercise on cellular respiration waste product production rates measuring photosynthesis and cellular respiration rates using the Floating Leaf Disk technique 7 BIOTECHNOLOGY BACTERIAL TRANSFORMATION Biotechnology simulation of transforming the human insulin making gene into a bacterial plasmid bacterial transformation of the jellyfish gene for green fluorescence into E coli transformation efficiency calculations and student guided inquiry of the newly transformed bacterial colonies 8 ENERGY DYNAMICS Environmental impact of eating at lower trophic levels energy transfer and productivity lab using yeast fermentation of corn sugar into ethanol and carbon dioxide and student guided inquiry on variables that could potentially increase the rate of fermentation for biofuel production

Unveiling the Energy of Verbal Artistry: An Psychological Sojourn through **Answers For Classzone Bacterial Transformation Lab**

In some sort of inundated with displays and the cacophony of instant connection, the profound power and emotional resonance of verbal artistry frequently diminish in to obscurity, eclipsed by the constant assault of sound and distractions. Yet, nestled within the musical pages of **Answers For Classzone Bacterial Transformation Lab**, a captivating function of fictional beauty that impulses with natural feelings, lies an memorable journey waiting to be embarked upon. Written by way of a virtuoso wordsmith, this enchanting opus instructions visitors on a mental odyssey, softly revealing the latent possible and profound impact stuck within the intricate web of language. Within the heart-wrenching expanse of this evocative evaluation, we shall embark upon an introspective exploration of the book is main subjects, dissect its charming publishing fashion, and immerse ourselves in the indelible impression it leaves upon the depths of readers souls.

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