

Lab Report Expectations for Transformation Lab

Your lab report must include the following:

- Introduction (with citations)
- Responses to Lab Questions
- Conclusion
- Works Cited

Additionally, your notebooks will be due with the lab report. The observations that you recorded will be checked for their thoroughness and organization. Also, your entire lab notebook will be checked for a separate grade.

Lab Questions

1. Please describe, at the cellular/molecular level, the precise steps involved in heat shock. That is, how can we force a bacterial cell to take up a plasmid? (The animation from the ch.20 slides might help here. Follow the link in the slides, click on “techniques” and then click on “transferring and storing” at the top of the page.)
2. If any of the predictions regarding bacterial growth made in the pre-lab considerations differed from your observed results, please describe them and explain why you believe you obtained these results.
3. What are you selecting for in this experiment? (i.e., what allows you to identify which bacteria have taken up the plasmid?)
4. Transformation efficiency is expressed as the number of antibiotic-resistant colonies per μg of plasmid DNA. The object is to determine the mass of plasmid that was spread on the experimental plate and that was, therefore, responsible for the transformants) the number of colonies) observed.

Because transformation is limited to only those cells that are competent, increasing the amount of plasmid does not necessarily increase the probability that a cell will be transformed. A sample of competent cells is usually saturated with the addition of a small amount of plasmid, and excess DNA may actually interfere with the transformation process.

- a. Determine the total mass (in μg) of plasmid used. Remember that you used $10\ \mu\text{L}$ of plasmid at a concentration of $0.005\ \mu\text{g}/\mu\text{L}$.
- b. Calculate the total volume of cell suspension prepared.
- c. Now calculate the fraction of the total cell suspension that was spread on the plate.
- d. Determine the mass of plasmid in the cell suspension spread.
- e. Determine the # of colonies per μg of plasmid DNA. Express your answer in scientific notation. This is your transformation efficiency.

5. What factors might influence transformation efficiency? Explain the effect of each factor that you mention.