DNA Ligation & Transformation

Grade Level:	**11 & 12 Summer Intern**	**Subject:**	**Biotechnology / Molecular Biology/ Techniques**	**Prepared By:**	**Larry Cosenza** **C2 Biotechnologies, LLC** **lcosenza@c2biotechnologies.com**

Overview & Purpose	**Education Standards Addressed**
Cloning. Basic DNA manipulations to combine different sequences.	

	Teacher Guide	**Student Guide**	
Objectives (Specify skills/information that will be learned.)	Engineering cloning and target gene expression vectors.	Skills to combine DNA fragments to generate new constructs.	**Materials Needed** • Bucket ice • Enzymes • DNA fragments • Competent bacteria • Heating block • Plates/antibiotic • Hood • Plate spreader • Flame • 37 Incubator
Information (Give and/or demonstrate necessary information)	Setting up Ligation and Transformation reactions. Predicting outcomes and analyzing results.	Determining controls and implementing experiment. Analyzing outcomes.	
Verification (Steps to check for student understanding)	Proper controls for ligation and transformation reactions.	Number of bacterial colonies correspond to ligation and transformation controls.	**Other Resources** (e.g. Web, books, etc.) Short Protocols in Molecular Biology www.neb.com
Activity (Describe the independent activity to reinforce this lesson)	Define protocol to combine two different gens to form a fusion gene.	List restriction enzyme digestions, fragment sizes, ligation reactions and anticipated final construct.	
Summary	Basic bread & butter molecular biology. Manipulating DNA fragments for analyses.	Use of controls to define and interpret experimental results.	**Additional Notes**