ABSTRACT

Elizabethkingia, a bacterial species causing human disease, was found to be resistant to many different antibiotics through beta-lactamase. Antibiotics are a type of medicine used to treat bacterial infections. While beta-lactamase is an enzyme that provides antibiotic resistance by breaking down the antibiotic structure. There are many different species of Elizabethkingia such as Elizabethkingia meningoseptica,ствие, and anophelis. Elizabethkingia is a species that was initially isolated from condensation water of the space station Mir (7). This species expresses multiple antimicrobial resistance phenotypes and is resistant to the action of many antimicrobials (Lin et al. 2012). Additionally, Elizabethkingia draft genomes have revealed that each species harbors numerous putative β-lactamase genes (4). The species expresses multiple antimicrobial resistance phenotypes and is resistant to the action of many antimicrobials (Lin et al. 2012). Antibiotics are a type of medicine used to treat bacterial infections; however, some bacteria have built up resistance against medicines. The mechanisms of antibiotic resistance vary from agent to agent, but they typically involve one or more of: target alteration of the drug in the bacterial cell, enzymatic modification or destruction of the drug itself, or limitation of drug accumulation as a result of drug exclusion or active drug efflux (8). We used PCR and molecular cloning techniques to determine if a gene from E. anophelis was a putative beta-lactamase gene or not. We designed primers that were used to drive the PCR Amplification of a region of the gene that produced products that overlap each other. After that we will use ligase to connect the DNA sequencing to the vector. Through this experiment we hope to determine the beta-lactamase genes contained in E. anophelis.

RESULTS

On our petri dishes, there were 60 colonies of resistant strains grown on gel and 22 colonies on pit disk 3. The growth of the E. coli on the petri dish shows which colony contains beta-lactamase gene. This petri dish shows an example of very little resistant growth by Elizabethkingia strain. With the transformation of E. coli by heat shock with two different plasmids, K10 (a broad spectrum and then) to determine gene resistant. The green colonies on the petri dish shows which colony contains beta-lactamase gene. This petri dish shows an example of very little resistant growth by Elizabethkingia strain.

DISCUSSION

There has been an interest in understanding the antibiotic resistance of the Elizabethkingia bacterium. Elizabethkingia species express a multiple antimicrobial resistance phenotype and are resistant to the action of many antimicrobials (Lin et al. 2012). Additionally, Elizabethkingia draft genomes have revealed that each species harbors numerous putative β-lactamase genes (Lao et al. 2015). Elizabethkingia anophelis is a dominant species resident in the mosquito gut and also a human pathogen (Kakukula et al. 2013). When given the DNA sequence for elizabethkingia miricola we predicted that our genetic sequence would be positive for encoding a beta-lactamase gene. In another experiment, multiple antibiotic resistance-associated coding sequences were detected, including sequences encoding 26 putative β-lactamases (Quick et al. 2014). Beta-lactamase provides antibiotic resistance by breaking down the antibiotics’ molecular structure within the bacterium (Neu 1969). Our genetic sequence was positive for the beta-lactamase gene but because the chemical compound nitrocefin was similar to our gene, the nitrocefin pad showed that our primer sequence was slightly resistant to a certain type of beta-lactam gene. Most of the cases due to improper antibiotic use cause serious life-threatening infections (Jian et al. 2014). To improve our results we could change the chemical compound used in determining if our sequence was resistant to another antibiotic.

REFERENCES


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MATERIALS AND METHODS

1. Set up PCR reactions 2. Ligate PCR product to plasmid 3. Set up DNA in gel for amplification 4. Examine DNA from gel bands. 5. The growth of the E. coli on the petri dish shows which colony contains beta-lactamase gene. This petri dish shows an example of very little resistant growth by Elizabethkingia strain. With the transformation of E. coli by heat shock with two different plasmids, K10 (a broad spectrum and then) to determine gene resistant.

EXAMINATION

On our petri dishes, there were 60 colonies of resistant strains grown on gel and 22 colonies on pit disk 3. The growth of the E. coli on the petri dish shows which colony contains beta-lactamase gene. This petri dish shows an example of very little resistant growth by Elizabethkingia strain. With the transformation of E. coli by heat shock with two different plasmids, K10 (a broad spectrum and then) to determine gene resistant. The green colonies on the petri dish shows which colony contains beta-lactamase gene. This petri dish shows an example of very little resistant growth by Elizabethkingia strain.

DISCUSSION

The experimental design of this study was to determine if a gene from E. anophelis was a putative beta-lactamase gene or not. We designed primers that were used to drive the PCR Amplification of a region of the gene that produced products that overlap each other. After that we will use ligase to connect the DNA sequencing to the vector. Through this experiment we hope to determine the beta-lactamase genes contained in E. anophelis.

REFERENCES