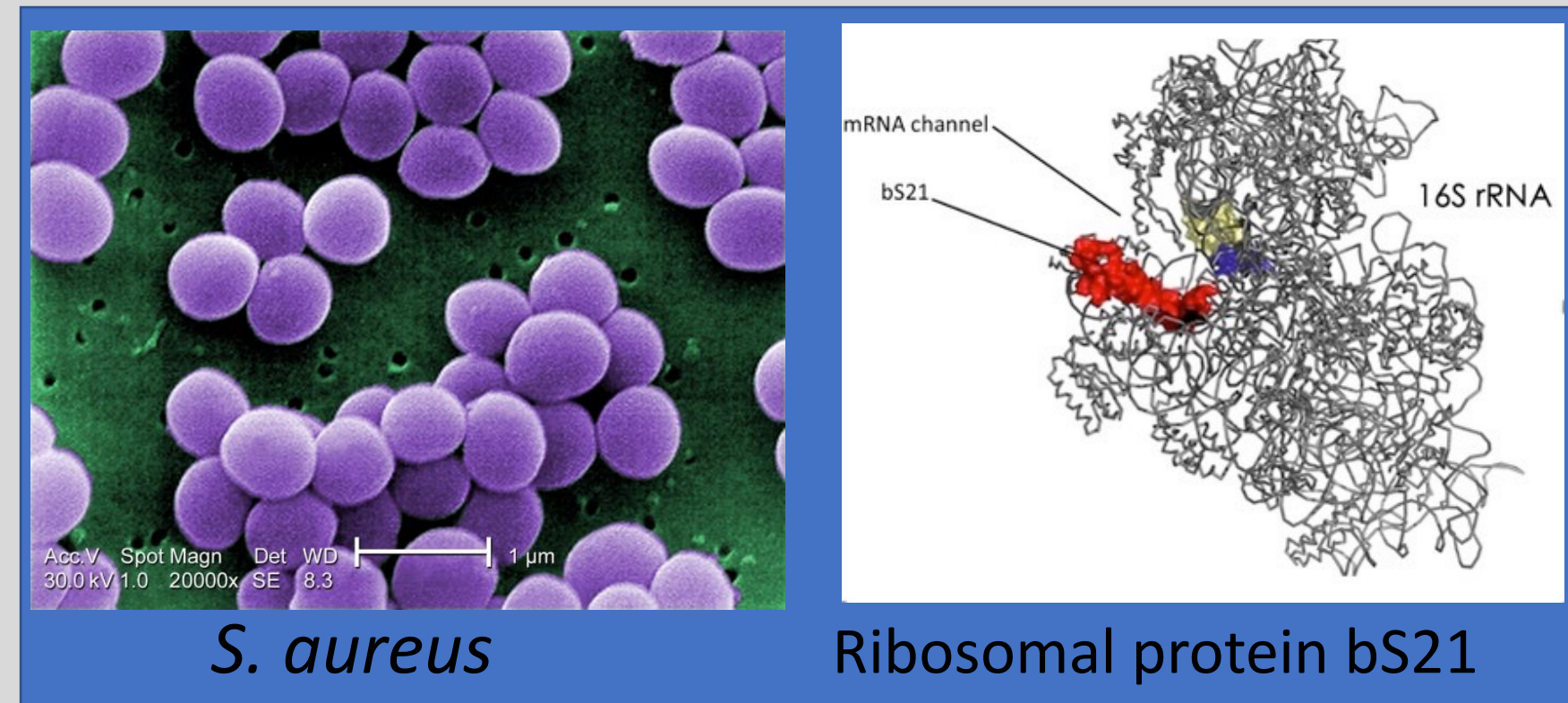


# Investigating the role of bS21 in vancomycin-resistant *Staphylococcus aureus*

Dan Floyd<sup>1</sup>, Hannah Trautmann<sup>2</sup>, Dr. Kathryn Ramsey<sup>1,2</sup>

<sup>1</sup>Cell and Molecular Biology, University of Rhode Island, Kingston, RI 02881

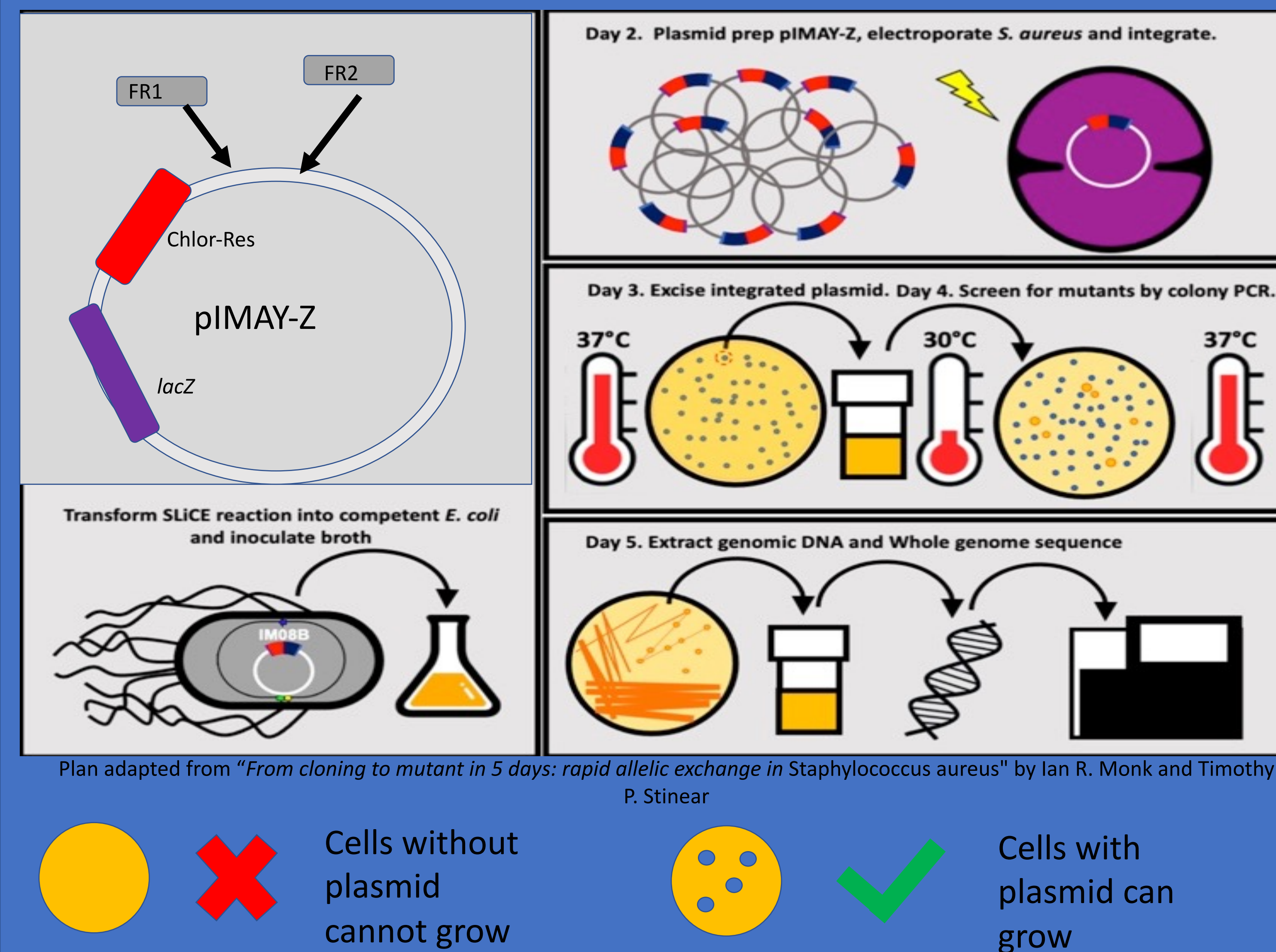
<sup>2</sup>Biomedical and Pharmaceutical Sciences, University of Rhode Island, Kingston, RI 02881



## *S. aureus*, vancomycin, and bS21

- *Staphylococcus aureus* is a Gram-positive pathogenic bacterium commonly known as the causative agent of staph infections
- Multiple strains with antibiotic resistance
- bS21 is a ribosomal protein, encoded by the gene *rpsU*, found in various bacteria
- Inactivation of *rpsU* in *S. aureus* is linked to vancomycin resistance
- In previous literature, it was seen that cells lacking bS21 had thicker cell walls
- My hypothesis is that cells lacking bS21 may have thicker cell walls and bS21 may be involved in the regulation of the cell wall biosynthesis

## Methods

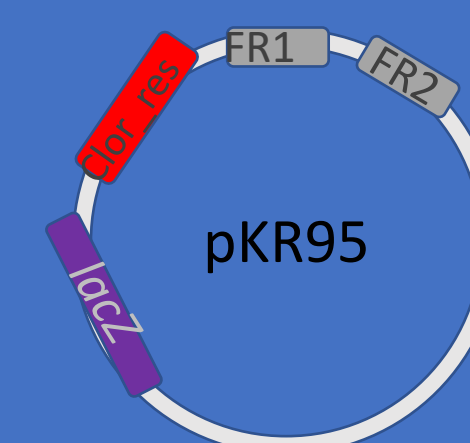


## Discussion

- Creating and cloning the pKR95 plasmid took a long time to do, approximately 7 weeks
- We adapted our plan from

## Results

- Through multiple DNA ligations and IMO8B *E. coli* transformations, I was able to successfully create the desired plasmid, pKR95.



- This plasmid will be used to knockout *rpsU* in *S. aureus* via allelic exchange, where I can then determine the level of resistance to vancomycin due to the absence of bS21

## Future Directions

- Use transmission electron microscopy to compare cell wall sizes
- Does bS21 have a similar effect in other pathogenic bacteria

### Literature Cited

Hiramatsu, K., Kayayama, Y., Matsuo, M., Aiba, Y., Saito, M., Hishinuma, T., & Iwamoto, A. (2014, June 7). *Vancomycin-intermediate resistance in Staphylococcus aureus*. Journal of Global Antimicrobial Resistance. Retrieved April 7, 2022, from <https://www.sciencedirect.com/science/article/pii/S2213716514000617?via%3Dihub>

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