Novel sRNA Candidates in *Treponema Pallidum*

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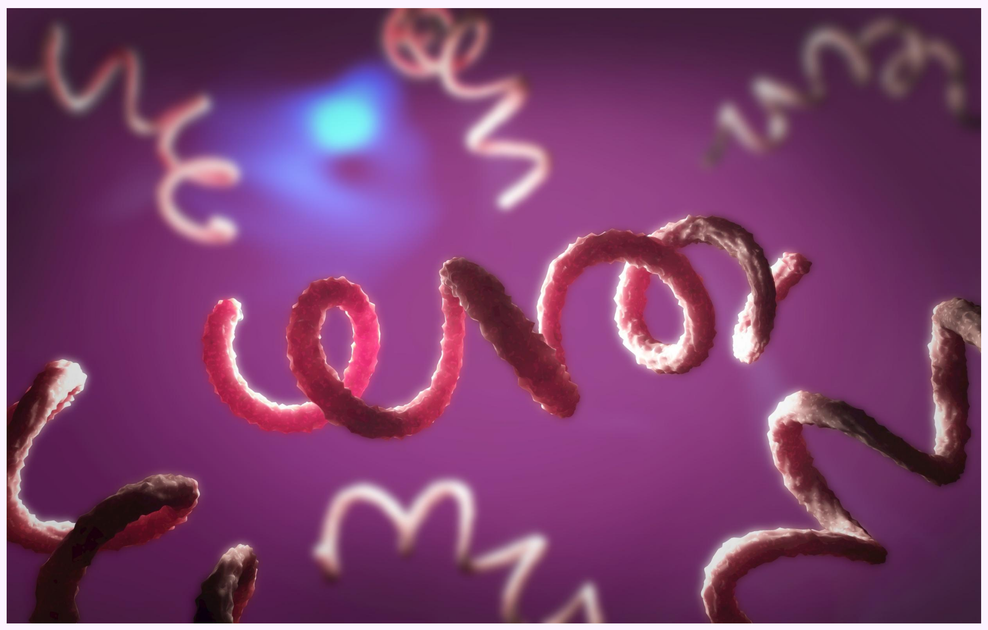
CPSP359G-0101
College Park Scholars Academic Showcase, May 9, 2025



3d illustration of a syphilis pathogen. Christoph Burgstedt- stock.adobe.com

Introduction

Bacteria like *Treponema pallidum*, the bacteria that causes syphilis, causes detrimental health problems. DNA regulation, a way bacteria and cells control proteins made, are important in understanding ways to stop diseases like syphilis. sRNAs are molecules that bind to DNA and physically cause DNA to be regulated. Finding undiscovered sRNAs in *Treponema pallidum* can help cause cures or prevent serious symptoms.

Activities

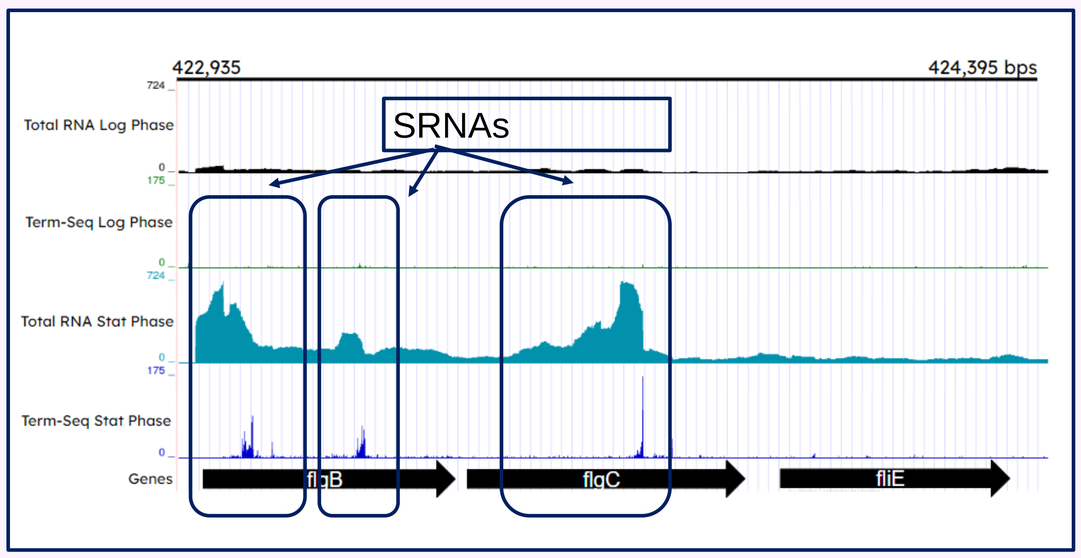
- I analyzed transcriptomic data
- I analyzed metabolomic data using the statistical programming language, R
- I listened to career advice: helped me realize I want to go to graduate school

Materials

- University of California Santa Cruz Genome Browser
- R
- Pubmed
- Ecocyc
- mFold

Methods

1. I found novel sRNAs in the *Treponema pallidum* transcriptome
   - Il ooked for continuous high peaks
   - These peaks represent high sRNA reads ~ where DNA regulation is possibly occurring
2. I used EcoCyc and PubMed to analyze what the gene does and how the novel sRNA influences DNA regulation in the gene
3. I used mFold to visualize the sRNA



Novel sRNAs I found near the flgB and flgC genes on the transcriptome.

Discussion

When I looked at the transcriptome, there were three novel sRNA's on two Flg genes. Flg genes create proteins needed for the syphilis bacteria to move

Impact

T. pallidum moves fast and can affect deep tissue of organisms. Understanding regulation in the Flg genes can be helpful to stop the spread of syphilis through the body

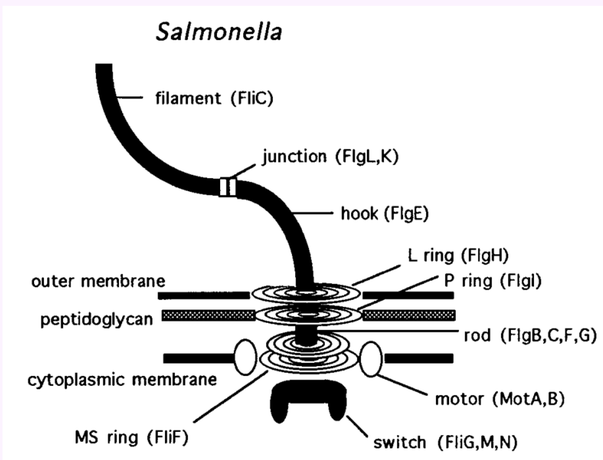


Diagram of flagellum of a spirochete (Heizerling, 1997)

Research Site

- National Institute of Health
- Virtual Student Summer Opportunities to Advance Research (V-SOAR)
  - Stay home, joined zoom meetings, did work on my own schedule
- Gisela Storz Lab
  - Section of Environmental Gene Regulation
  - Identify and characterize small RNAs and open reading frame
  - storzg@mail.nih.gov
- Eunice Kennedy Shriver National Institute of Child Health and Human Development
  - Find knowledge to understand human development, reproductive health, and improve life of children and adults
  - nichdpress@mail.nih.gov
  - 301-496-5122

Future Work

I hope to gain more experience working with bacteria and connecting it to my future career goal of being a cancer researcher. DNA regulation can influence the cause and cure of cancer.

Acknowledgements:

Site Supervisors and Mentors: Dr. Gisela Storz, Dr. Philip Adam, Dr. Matthias Machner
SGC Professors: Dr. John Merck, Dr. Thomas Holtz