

# **The Potential of Probiotics**

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### Introduction:

For this project, we studied the effect of natural skin probiotics *L. rhamnosus* and *L. plantarum* on *S. epidermis,* which causes skin infections and foodborne illness. This is a significant question to explore, as *Staphylococcus* species are able to gain multidrug resistance through gene transfer.



parison of *S. epidermidis* alone and in co-culture with *L. plantarum* (a) and *L. rhamnosus* (b) between single and ed culture at 0, 4, 8, 12, 24, 48, and 72hr in BHU/MRS medium (1:1, v(v)). Growth medium pH measurements taken at the same timepoints (c, d). Asterisks induced significant difference of growth in mixed culture when pared with single culture as a control at  $p \le 0.05$ .



Using the PCR machine

## Future Work:

I plan to continue working in the lab and choose an alternative research project. I will be able to dedicate more time to research and have more conclusive results, as the bulk of my first semester at the lab consisted of training.



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#### Activities:

I conducted various wet-lab activities such as PCR, RNA isolation, preparing the correct medias for each bacteria (MRS/BHI), and measuring pH in order to measure bacteria concentrations and gene expression (not shown). This was a seamless opportunity and there were no issues, except for the experiment taking a lot of time (it is still ongoing)!



Effectiveness of *Lactobacillus* CFCS by measuring the growth (a) and biofilm formation (b, c) of S. epidemidis treated with 50% CFCS in BHI for 24, 48, and 72hr, with S. epidemidis in BHI/MRS (1:1, v/v) as control. Bars with different letters (a through c) at a single timepoint within each treatment are significantly different at v = 0.05

#### Site Information:

I researched at the Biswas Lab here at UMD:

8127 Regents Drive, College Park MD 20742 (Animal Sciences Building)

- Microbiology lab that focuses on bacterial foodborne pathogens and host-bacteria interactions
- Open to anyone who wants lab experience (usually life sciences majors)

### Final Thoughts:

Lactobacillus species, which are probiotics found in our skin (and gut) microbiome are effective at outcompeting and inhibiting the growth of pathogenic *S. epidermis*.

#### Acknowledgments:

Thank you to Anna Phan who guided me through the research process, and to Dr. Biswas for getting me acquainted with the lab. Thank you to Dr Holtz & Dr. Merck for guiding me through my scholars experience!

