



Delving into the World of Microbiology

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Biochemistry

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College Park Scholars Academic Showcase, May 8, 2015



Introduction

From June 2014 to December 2014, I worked and researched in Dr. Lakshman's pathological microbiology lab. I decided to intern at the lab in order to first learn about how to conduct research and to learn microbiology, along with molecular biology methodology.

Site Information:

Sustainable Agriculture Systems Lab: Floral and Nursery Plants Research Unit

Room 226

10300 BALTIMORE BLVD, BLDG 001 BARC-WEST, BELTSVILLE, MD, 20705-2350

Dr. Dilip Lakshman and Dr. Jaba Mukhopadhyay

Goals of Lakshman Lab: To conduct research on soil-borne fungal pathogens of ornamental plants, namely the *Rhizoctonia solani*.

To maintain and create a cDNA library of these fungal pathogen strains.



A *Rhizoctonia solani* culture on a selective growth medium

Issues Confronting Site:

The Agriculture Systems Lab is mainly concerned with maintaining biodiversity and allowing plants/crops to persist through disease.

Activities:

In the Lakshman Lab, I first started out learning about the basic techniques of microbiological and molecular biological research. I learned how to pipette properly, clean dishes and eventually elevated to learning more about actual microbiology, like plating cultures, centrifugation, bacterial and viral transformations, cell culturing, and more!

After learning more about microbiology, the next step was to learn it on the molecular level. I started preparing DNA samples from scratch with the goal of analyzing them through gel electrophoresis. I learned more analytical techniques such as Northern and Southern Blotting, PCR, Ethidium Bromide Staining and vector cloning.

After learning the methods, I began to do several small parts of multiple experiments, such as preparing the DNA sample of the fungus in question through molecular analysis. The most important role I played was in the creation and maintenance of a cDNA library, which would allow for future research involving the *Rhizoctonia solani* strains to be much easier.

Impact:

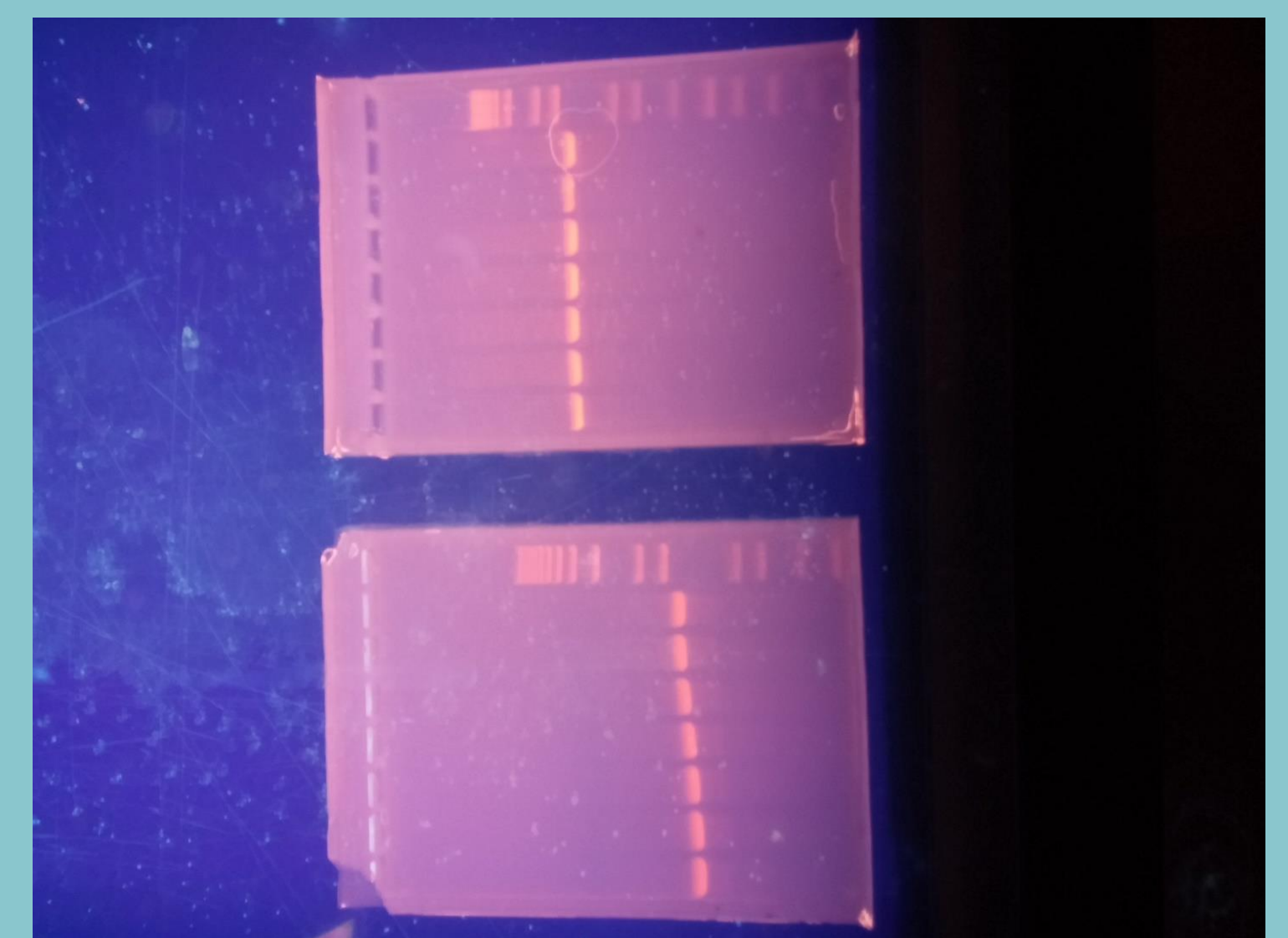
The Sustainable Agriculture Systems Lab has been able to discover many methods of combating plant disease and in effect helping maintain biodiversity.

Discussion:

The experience of working in a microbiology lab has given me insight at how research is conducted and has allowed me to learn practically the most important and relevant techniques in experimental biology today. My most significant realization was about how tedious, but rewarding research is.

Future Work:

I recently have begun work on a Biocontrol bacterial experiment that involves bacteria around legumes. The goal is to isolate which bacteria of the around 20 million or so naturally kill off the pathogen for the legume root.



An Ethidium Bromide Stained Gel for analyzing a Northern Blot

Acknowledgments:

I would like to give a special Thank You to Dr. Lakshman and Dr. Mukhopadhyay for allowing me to learn so much about research and nurturing a love of microbiology! I would also like to give a huge Thank You to Dr. Holtz and Dr. Merck for motivating me to succeed and work hard!

