# Antibiosis of Blue-Stain Fungi Using Plant Growth-Promoting Rhizobacteria

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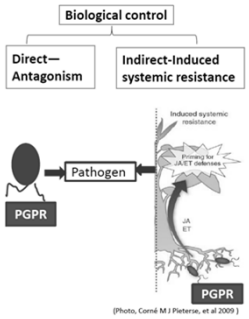
## Plant Growth-Promoting Rhizobacteria (PGPR)




- Root-colonizing bacteria that promote plant growth and control of plant disease





## Introduction

- Use of microbes to control diseases is becoming more common
- An environmentally friendly approach
- There is evidence of induced systemic protection to fusiform rust in loblolly pine by PGPR (Enebak 2000)

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## Objective

- To understand if different Plant Growth Promoting Rhizobcterial (PGPR) strains will inhibit the growth of blue-stain fungi

## Hypothesis

- Some of the well characterized PGPR strains will exhibit *in vitro* antibiosis against the blue-stain fungi

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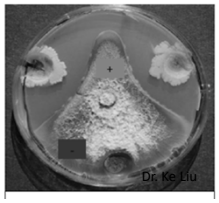
## Methodology

- PGPR strains pre-identified using 16s rDNA sequencing methods
- 30 strains of PGPR used

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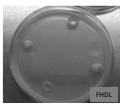
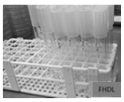
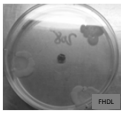
## Methodology




Malt Extract Agar plate with holes filled with Tryptic Soya Agar on four sides

$10^8$ colony-forming units (CFU) of PGPR

Fungal disc inoculated at the center of agar plate
Fungi-LT, GH, GA, and LP

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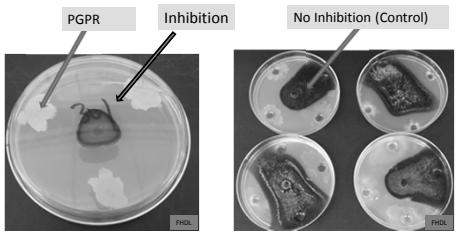
## Results

- PGPR inhibited the growth of the fungi
- No sporulation around the inhibition zone
- Fungal growth towards the control side was not inhibited

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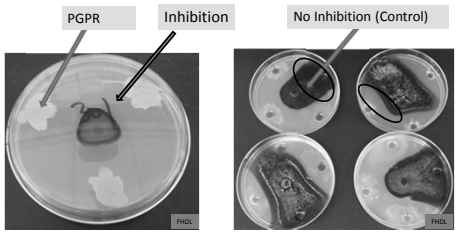


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## Results

- Out of 30 tested strains
  - 26 and 11 significantly inhibited *L. procerum* and *L. terebrantis*
  - 26 and 10 significantly inhibited *G. alacris* and *G. huntii*

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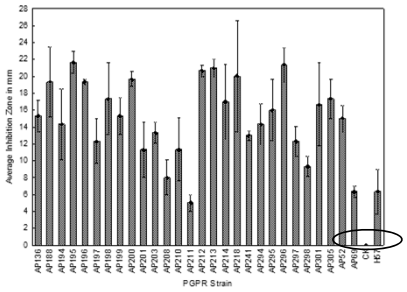
## Results- *Leptographium procerum*

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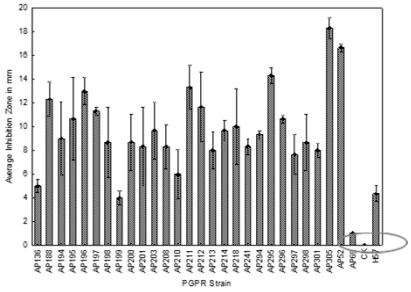
## Results- *Grosmannia alacris*

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## Objective

- To understand if PGPR strains will induce the systemic resistance of loblolly pine to blue-stain fungi

## Hypothesis

- PGPR will induce the resistance of the loblolly pine to *L. terebrantis* and *G. huntii*

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## Methodology

Inoculation of $10^8$ CFU/ml of 3 different rhizobacteria by soil drenching

After 2 weeks- Inoculation of *L. terebrantis* and *G. huntii*

8 weeks following inoculation - Seedling biomass, lesion, height, and RCD change

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## Conclusion

- Most of the studied PGPR strains inhibited the growth of the fungi
- Fungal sporulation was inhibited
- Study demonstrates that PGPR produce some metabolites which inhibit the growth of the fungi

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## Acknowledgement

Dr. Lori G. Eckhardt
Dr. Joseph W. Kloepper
Dr. Ke Liu
Forest Health Dynamics Laboratory
Department of Plant Pathology and Entomology
My Labmates

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