

Highly Potent Cellulosin/Endosidin20 Analogs for Inhibiting Cellulose Synthesis in Biofilms for Improved Crop Management

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Categories:

- Agriculture
- Food and Nutrition

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- Agriculture
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- Agrobiosciences
- Biochemistry
- Biofilms
- Cellulose
- Crop Improvement
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Researchers at Purdue University have developed new combined cellulysin and endosidin20 inhibitors to prevent biofilm infections from forming in crops. Cellulose is an enzyme that enables cell wall formation in plants and contributes to plant growth. Cellulosin is a state-of-the-art inhibitor that actively stimulates plant immune response as well as targets cellulose and endosidin exhibits high potency in eliminating cellulose biosynthesis for biofilms. Together, they can have a unique highly potent synergistic effect. Purdue researchers were able to fine-tune and evaluate several analog combinations of these plant inhibitors, as kind of plant therapeutic, to achieve prevention of up to 50% of growth of harmful biofilms in crops. An experiment was conducted over seven days of treatment with cellulysin/endosidin20-1 and cellulysin/endosidin20-2 analogs to treat common bacterial biofilms. Plant cells in were continuously monitored using ImageJ software during the experiment. Results show that the new plant therapeutics cause cellulose to form a dry mass and that between 45-75% of this biomass can be targeted and eliminated using a smaller amount of plant therapeutics than traditional methods.

Advantages:

- Successfully Eliminates Cellulose
- More Cost Effective

Potential Applications:

- Crop Management
- Botany and Horticulture

Technology Validation: Testing with a type of invasive bacterial biofilm that has strong growth by cellulose

Recent Publication:

American Society of Plant Biologists

Endosidin20 Targets the Cellulose Synthase Catalytic Domain to Inhibit Cellulose Biosynthesis

DOI: 10.1105/tpc.20.00202

People:

- Zhang (DECEASED), Chunhua (Project leader)

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