

CLEAN RESOURCES

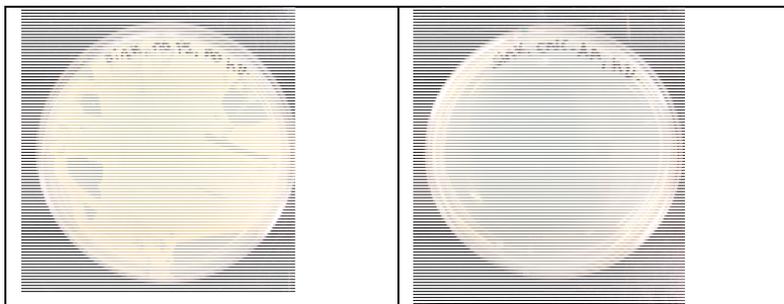
BIOINDUSTRIAL MATERIALS

BIOMATERIALS

FUNDING
DETAILS

Light Activated Crystalline Nanocellulose for a Clean Environment

Antimicrobial resistance is a rapidly developing problem in healthcare, food and other sectors, and is associated with a rise in hospital-acquired bacterial infections. Current cleaning practices and new medications are proving inadequate to control microbes. Dr. Belinda Heyne and her research team have developed a CNC-based light-activated disinfectant material (CNC-AA) that kills micro-organisms directly on contact. CNC-AA has potential as an alternative disinfectant that is safe, environmentally friendly and not susceptible to antimicrobial resistance. Dr. Heyne's team have confirmed the antimicrobial effectiveness of CNC-AA in aqueous solution against *Staphylococcus* and *E. coli*. In this project, they aimed to evaluate commercial applications of CNC-AA as a disinfectant.



Bacteria collected via swabbing method on the faucet of a hospital bathroom sink was grown on agar petri dishes. The petri dish which does not contain CNC-AA showed bacterial overgrowth (left panel). No bacterial growth was detected on the petri dish that contained CNC-AA at 2mg/L and was exposed to ambient light for 1h (right panel).



RECIPIENT:
University of
Calgary



PARTNERS:
Alberta Innovates



TOTAL BUDGET:
\$613,831



AI FUNDING:
\$210,081



PROJECT DATES:
MAR 2018 -
NOV 2020



PROJECT TRL:
Start: 4
End: 6

APPLICATION

CNC-AA as a light-activated disinfectant has potential application in the healthcare sector and industries where surface hygiene is paramount, such as food processing, space and aviation. In the growing disinfectant market, the competitive advantages of CNC-AA include a lack of hazardous chemicals and environmental friendliness.



PROJECT GOALS

- Develop process chemistry to scale up production of CNC-AA.
- Evaluate impact of CNC-AA on treated surfaces commonly found in hospitals and compare to conventional disinfectants.
- Test safety of surfaces after disinfection.
- Develop paint and disinfectant prototypes.
- Apply for patents to protect intellectual property as part of a business development strategy.

BENEFITS TO ALBERTA

- Deliver a disinfection product that does not increase, and is not affected by, antimicrobial resistance to antibiotics.
- Reduce health risks associated with microbial contamination and antimicrobial resistance in health, food and other hygiene-sensitive industries.
- Diversify Alberta’s economy and create new, highly skilled jobs to for production and marketing of this new production.
- Commercialize new, high value uses and markets for crystalline nanocellulose, an emerging advanced material.



1 Student Trained



1 Patent



1 Project Job



1-10 Future Jobs



1 Spinoff Company

CURRENT STATUS

NOV 2020

The project is complete. The targeted application of applying CNC-AA on surfaces as a component of selected paint compounds was not successful due to several factors, including interference of paint compounds with CNC-AA disinfection effectiveness. A different medical application was identified as a viable opportunity. Hnu Materials Inc. was established to advance business development, with guidance from Creative Destruction Laboratories. A patent was applied for during the Project.