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Science at Dakota State University

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Science at Dakota State University



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SCIENCE AT DSU IS...



- Developing a mobile phone app to replace expensive scientific equipment for underfunded labs.



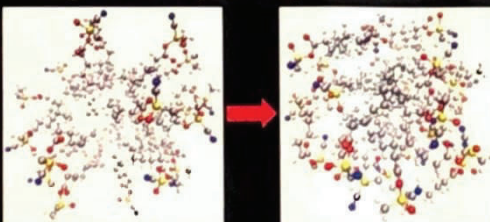
- Studying the environmental and human health impacts of land-disposed sewage sludge biosolids.



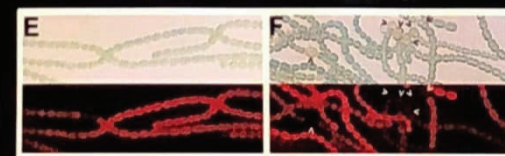
- Studying the conversion of biologically inactive to active molecules in prebiotic environments.



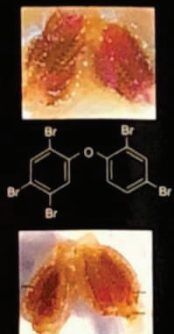
- Drug discovery in deep ocean bacteria.



- Studying biomolecular emergence and self-assembly in prebiotic conditions using molecular modeling.



- Studying cellular differentiation and pattern formation in the filamentous cyanobacterium *Anabaena*



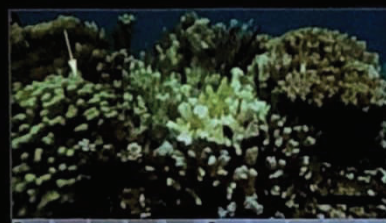
- Studying how chemical additives in consumer products move through South Dakota food webs and impact environmental and human health.

- Studying the pre-industrial environment of South Dakota using century-old preserves.



- Presenting and publishing internationally.

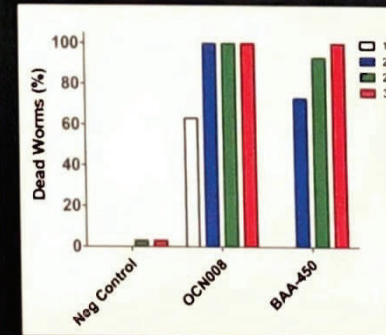
Assessment of Wax Worm (*Galleria mellonella*) Larva as a Model System to Study the Virulence of *Virbio coralliilyticus* Coral Pathogens



Coral disease is causing mass mortality of coral reefs all over the globe. Strains of *Vibrio coralliilyticus* are especially virulent and can also infect fish and shellfish, posing a massive risk for the tourism and fishing industries. To combat the devastation of these pathogens, they must be studied in the lab, however, coral studies are expensive and damage already stressed coral systems. We hypothesize that the larva of *Galleria mellonella* (Greater Wax Moth) can serve as a viable alternative model for studying *V. coralliilyticus* infections in sensitive coral.



To assess the efficacy of wax worm larva as a model organism, wax worms (n=30) were injected with 10 μ l dilutions of *V. coralliilyticus* strain BAA-450, OCN014, OCN008, or artificial sea water (ASW) as a control. We have shown that 10⁵ CFU/mL of any of the strains yields 100% mortality in 24 hours at 27°C, while ASW injection or no injection controls yield < 2 deaths. Additionally, the strains exhibit temperature dependent mortality rates in wax worms that closely mirror temperature dependent infection in coral fragments. These results indicate that wax worms are an economical and reproducible alternative model organism for studying coral pathogenesis. Work is ongoing to assess infection rates over wider temperature and pH ranges.



Work to be presented at ASM Microbe 2018 Conference, Atlanta, GA