

Innovation Month Student Highlights - 2018

Caleb Renshaw

Undergraduate Researcher

Senior, Biochemistry and Philosophy; Minor: Mathematics

Renshaw, from Boise, studies how mutations in bacteria can improve their growth. He looks at the specific chemical reactions, or metabolic pathways, needed for growth, and compares the growth of bacteria with baseline metabolic pathways to those with mutated metabolic pathways.

What are you hoping to gain from your involvement with the Undergraduate Research Symposium?

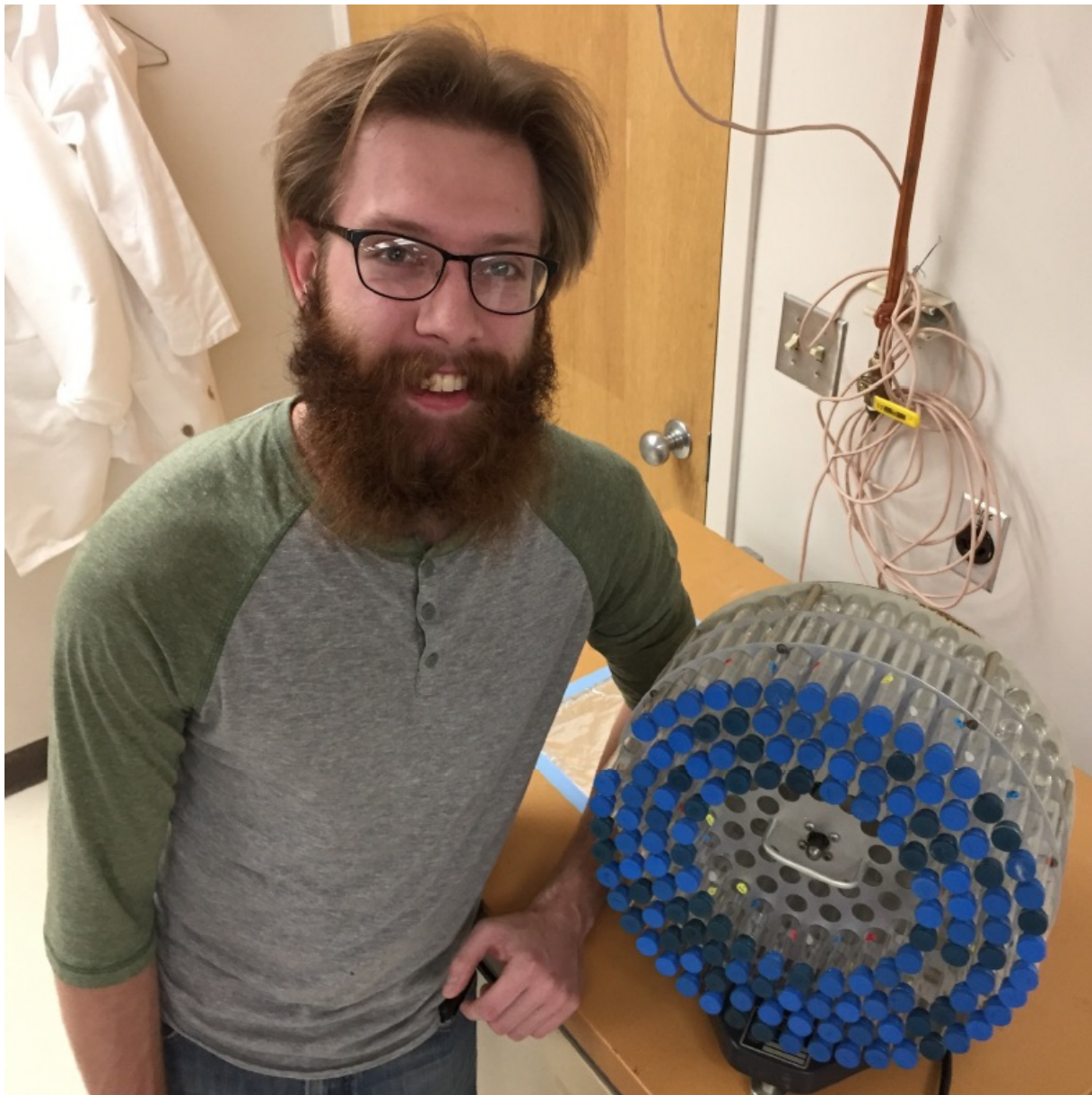
“I want to get experience with the process of publication and presentation. You can have the most beautiful data but that doesn’t mean a lot if you can’t share it or explain it in a way that people can understand. As for what I have gained from doing research, I now have a healthy appreciation for the fact that all of science is trouble shooting.”

How did you come up with your research project?

“Bacteria don’t want to just have the best pathway. They want to have a system for finding the best pathway. A system that allows for experimentation and adaptation increases the types of environments that the bacteria can handle. They are better prepared for the unexpected. Our project may show how bacteria acquire a new metabolic pathway and use that to improve its ability to function.”

How will your findings change the world?

“These bacteria, *Methylobacterium extorquens*, live on plant leaves. The bacteria feed on toxic methanol produced by the plant and then give their waste products back to the plant. If we have an understanding of that interaction, we can design bacteria to be even more beneficial to the plant and introduce the improved bacteria to the plant. This could increase crop yields for either biofuels or food.”



Caleb Renshaw

Team Biochar

Team members

- Charles Dolar, senior, business marketing and advertising
- Audrey Wootton-Franusich, senior, business marketing and entrepreneurship
- Devin Kohles, junior, renewable resources and business
- Adam O'Keefe, senior, biological engineering
- Jake Hall, senior, mechanical engineering
- Rachel Rosasco, senior, biological engineering
- Will Seegmiller, senior, mechanical engineering

■ Joe Stanley, senior, electrical engineering

The Biochar project is the brainchild of eight students across U of I. It's an attachment to a boiler unit (energy source) in a lumber mill that uses exhaust heat from the boiler unit to turn wood chips or other waste into biochar. Biochar is a healthy soil additive for farmers that enhances crop yields, reduces soil erosion and holds moisture longer.

What are you hoping to gain from your involvement with the Idaho Pitch and Business Plan Competition?

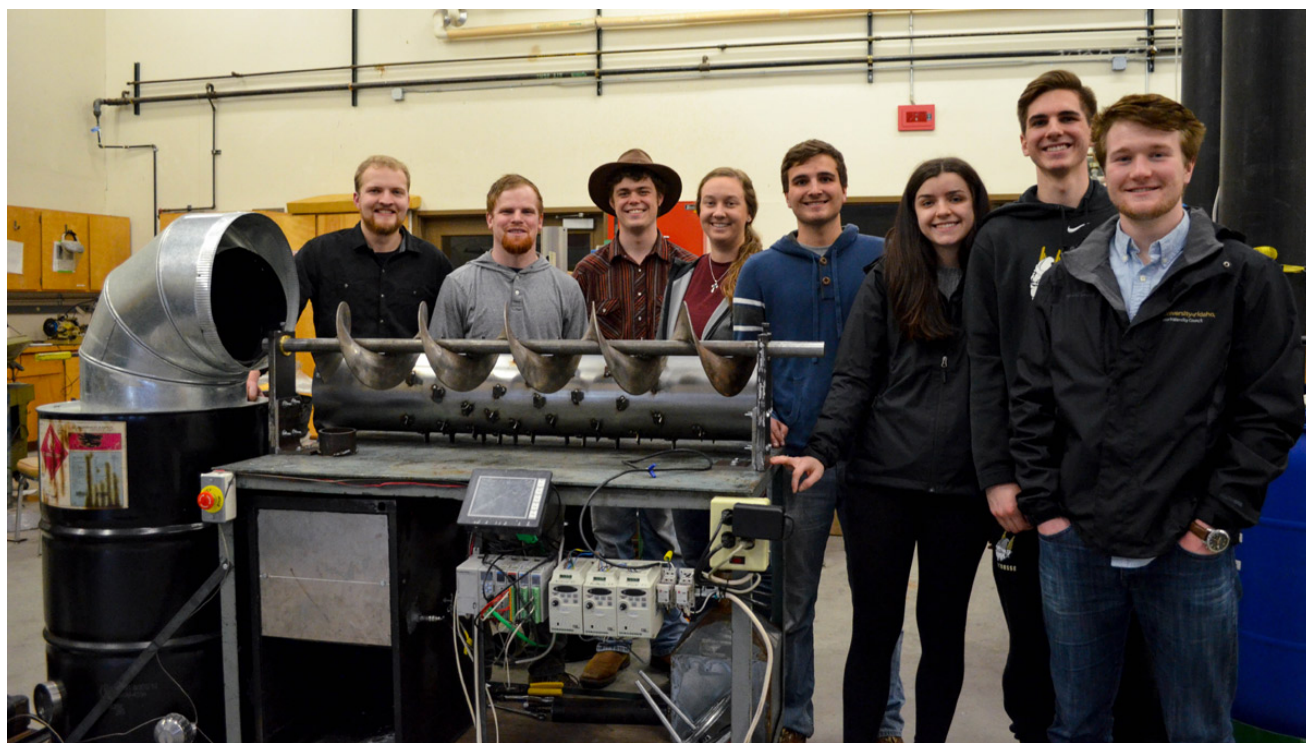
"We're hoping to gain insight into the possibility of taking our product to market. Obviously, judges and investors have much more experience than we do, so we hope to get valuable feedback to take this project to the next level. We are also looking to network and make connections with people in the industry."

How did you come up with your idea?

"The advisor for the engineering students on our team presented them with the idea. They decided to take on the project and build a working prototype as part of their senior capstone course. They brought on the business students to determine the feasibility of the project and create a business plan."

If your idea was a reality today, how would it change the world?

"Biochar exists, but it's hard to obtain in large quantities for an affordable price. Our device would allow for bulk, continuous production of biochar, therefore making it an economically viable option for farmers. Using biochar, farmers could combat erosion, increase crop yields without needing to over-apply fertilizers, and have more sustainable farming practices. As for the lumber mills from which we obtain wood chips, our device would reduce their costs and make their processes more sustainable and efficient."



Members of Team Biochar pose with a prototype of their device.