University of Lethbridge

News Release

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University of Lethbridge iGEM pivots project, earns silver with prototype genome machine

Scientific discovery is rarely linear — as evidenced by the University of Lethbridge's iGEM team and their silver medal performance at the 2025 Grand Jamboree in Paris.

What started as a project designed to create an efficient and ethical method for hyaluronic acid production (utilized by the cosmetics industry), led the group down a path that resulted in the creation of a prototype DIY genome engineering machine for open-source use.

Abby Giacchetta, a third-year neuroscience student and team member, says that as they progressed with their original project, a new focus emerged.

"We needed a way to make the hyaluronic acid, and we wanted to use E coli by mixing genes into its plasmid to spur the production of a hyaluronic acid biofilm," she says. "To do that, we needed access to a multiplex automated genome engineering (MAGE) machine that is worth about $90,000 — and we didn't have that kind of money."

So, necessity being the mother of invention, they decided to make their own.

"Our solution was OSAGE, or open-source automated genome engineering, which was designed to use cheap and easily accessible parts online and 3D printed pieces, because most people have access to those these days," adds Giacchetta.

They then learned, as the science competition season began, that trying to do both projects just wasn't feasible. So, they put aside the quest for hyaluronic acid production and focused solely on refining their OSAGE machine. In true iGEM spirit, the group of 16 students plus supervisor Dr. Laura Keffer-Wilkes, built off previous work from the iGEM community in designing their prototype.

“One of the great things about iGEM is that it is open source, meaning everyone has access to all the great work that’s been done in previous years,” says Keffer-Wilkes. “They chose to build off of previous work to create a system that could then be utilized by future generations of iGEM students for their projects, as it basically allows you to create any kind of bacterial strain you want to engineer.”

Rather than cost $90,000, OSAGE can be constructed for just under $1,000. The judges at the World Jamboree were impressed with the concept, netting a silver medal award for the group. Many indicated they liked the idea of expanding on past projects and continuing the strong science done before them.

“They saw the vision we had and really liked the idea,” says Tarlan Goharian, a fourth-year neuroscience major and team member. “We had a couple judges who told us it’s tough to see groups work on a project for eight months, you get so far with it, show the judges and then it sits in the archives forever.”

That won’t happen with OSAGE, as the group vows to return in 2026 and take the machine to the next level.

“We’re hoping that in the next year we’ll actually get it working with a full prototype and then be able to go back and use it to make hyaluronic acid,” says Giacchetta.

They are also looking to add to their team with members from across fields of study.

“Going forward, it would be great to have students from many different disciplines as part of the team,” says Keffer-Wilkes. “Abby and Tarlan are both neuroscience majors, but they had the opportunity to get into synthetic biology with this project. We had people working on hardware and printing, writing code, creating business proposals and then there are marketing and social media campaigns. It’s valuable experience because when you get into the business world, you aren’t just working with people in your major.”

The team is currently taking applications for its 2026 cycle. Interested students should check the iGEM web page and contact kefferwilkesl@uleth.ca.

The full 2025 team lineup included: Dr. Laura Keffer-Wilkes, Abigail Giacchetta, Tarlan Goharian, Odin Schaefer, Aaron De Silva, Zaki Olvis, Ayden McCue, Charles Abdelmessih, Sonia Ahuja, Mikaela Erickson Aguilar, Ashkan Mosabeb-Omran, SarahAnn Walker, Jan Sharma, Sabrina Werner, Eugene Gu, Anh Vo and Jay Cranston.

To view online: https://www.ulethbridge.ca/unews/article/university-lethbridge-igem-pivots-project-earns-silver-prototype-genome-machine

PHOTO: The ULethbridge iGEM group that travelled to Paris included, from left to right: Odin Schaefer, Abigail Giacchetta, Tarlan Goharian, Sonia Ahuja and Sabrina Werner.

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