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## Chemistry Majors Set Sights on Graduate School

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## Chemistry Majors Set Sights on Graduate School

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Of the seven chemistry majors who graduated from Dordt University this year, five are heading to graduate school in the fall. Marcus Van Engen will attend graduate school in Pittsburgh to study organic chemistry. Abbey Bos is headed to Iowa State University for veterinary school. Evangeline Colarossi will earn a master's degree in material science engineering at Colorado State University. Aidan Bender is set to start a Ph.D. program in nuclear engineering at the University of Utah, and Bryce Andry will begin pharmacy school at University of Iowa.

They all majored in chemistry, but they're each taking a different path post-Dordt.

"This demonstrates the incredible versatility of chemistry, which has important connections to every other field of science and surrounding areas," says Dr. Channon Visscher, associate professor of chemistry and planetary sciences. "It's a major that provides students with knowledge, experience, and skills for a lifetime of exploration and service over a wide range of circumstances."

“Many chemists refer to chemistry as the ‘central science,’” says Dr. Carl Fictorie, professor of chemistry. “Chemistry plays a role in biology, engineering, agriculture, medicine, and other areas. Thus, there are chemistry-related positions in all kinds of research and industrial fields. A chemist can go into a medical field, do research on new drugs or help manufacture them, work for an ethanol plant, make paint and coatings, work in environmental remediation, or go into marketing, or even pursue a degree in law emphasizing patents or intellectual property.”

For many chemistry majors, attending graduate school is the best next step to pursuing their career goals.

“Graduate school can provide specialized training so that chemistry majors can pursue their dream careers,” says Dr. Joshua Zhu, assistant professor of chemistry. “I think it’s important for chemistry majors to consider graduate school as an option.”

The chemistry majors who graduated this year are a very close-knit group who enjoyed spending time getting to know their faculty members.

“It is wonderful when a question on an assignment or an advising session spontaneously turns into an hour-long chat about school, career, life, faith, and the like. It’s also great when students get excited about a demonstration, or an aspect of lab. When they start to really see the wonder of creation before their eyes,” says Fictorie.

The students are hard-working, persistent, and curious—characteristics that served them well during the graduate school application process and a senior year affected by the COVID-19 pandemic.

What drew the chemistry majors to their intended career paths? How did they prepare for and apply to graduate school while juggling schoolwork and other commitments? And what drew these students to study chemistry at Dordt in the first place?

From choosing Dordt to dealing with an unexpected conclusion to their senior year, Colarossi, Andry, and Bender shared what it is like to study chemistry at Dordt and to make plans for post-Dordt life.

### **Evangeline Colarossi**

Evangeline Colarossi grew up in rural Kansas, and when it was time to decide where to attend college, she thought she would attend one of the state universities.

“I wanted to go to a Christian college that had a good science program, but none of the Christian schools in Kansas really focus on the sciences,” she says.

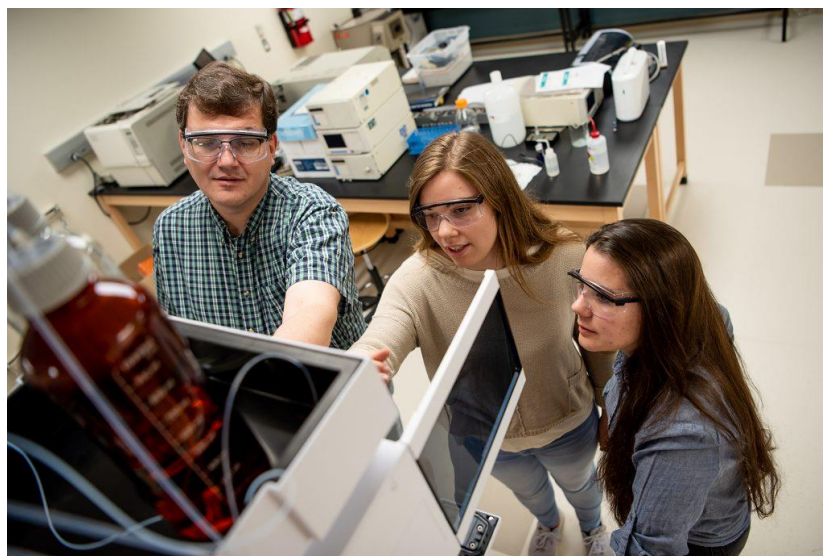
Initially, she chose a state university that had a good chemistry program. However, after visiting the campus a few times, she realized she wasn't very comfortable there. Her parents had heard about Dordt University through a family friend, so they encouraged Colarossi to check Dordt out.

During a visit to Dordt's campus, Colarossi attended a Sunday night worship service. She was impressed with how many students were worshipping God and being open with each other.

“I remember thinking, ‘This is what I want to be part of,’” she says. At that point, she hadn't even met any professors or seen the campus facilities, but she knew that Dordt was the place she wanted to spend the next four years.

Colarossi also knew she wanted to major in chemistry. As a Dordt student, she dove right into her chemistry courses. Two of her favorite courses were Physical Chemistry and Instrumental Analysis—she says she's most interested in numbers and calculations and not as interested in the theoretical.

“With Instrumental Analysis, you get to work with many of the instruments Dordt has on campus,” she says. “In Physical Chemistry, it's more of a numerical-based chemistry course, so a crossover between chemistry and physics.”



Evangeline Colarossi (right) stayed on campus last summer to work on a research project with Dr. Carl Fictorie.

She spent time getting to know her chemistry professors while working as a teacher's assistant, conducting research during the summer months, or just having conversations with them after class.

"My professors made sure to take time to get to know me not just as a student, but as a friend," she says. "I'm comfortable going to them with any questions I have, and they'll help me."

By her sophomore year, Colarossi knew she wanted to get a master's degree in chemistry. She met with Dr. Carl Fictorie to learn more about the branches of chemistry. "I told him that I'd enjoyed the physical and numerical side of chemistry the most, and he suggested I look into analytical chemistry," she recalls.

Analytical chemistry is a broad field, and Colarossi didn't determine exactly what she wanted to study within that field until this past November, when she went with two other chemistry majors to a "Women of STEM" conference at the University of Nebraska-Lincoln. One of the speakers was a material science engineer, who worked at the U.S. Naval Laboratory.

"I'd never heard of material science engineering before, but as she was explaining what it was, I realized that studying material science engineering was what I wanted to do," recalls Colarossi. It's a more defined branch of analytical chemistry, incorporating elements of physics, chemistry, and engineering.

As part of her graduate school applications, Colarossi had to take the Graduate Record Examinations (GRE). But the universities she applied to seemed more interested in what courses she had taken and how involved she was on campus. Colarossi was involved in a variety of on-campus activities during college; she wrote for the *Diamond*, Dordt's student-run newspaper, and was the natural sciences representative for student government. She also was part of Dordt's dance team and ran on the cross country team.

Being active on campus meant that she had to learn how to balance her time well. During her senior year, she took classes during the morning and had labs in the afternoon. In-between classes and labs, she studied in the chem room, a small computer lab across from the chemistry lab where she and her fellow chemistry majors worked on homework together. She tutored drop-in study sessions for chemistry and physics, and she also had meetings or practices in the afternoon and evening—along with homework.

When it came time to apply to graduate school, she stayed organized. Having identified the universities she wanted to apply to, she made a list of the documents, transcripts, letters, and other application materials she would need to submit, along with their due dates. Before she went home for Christmas break, she met with the Career Development Center to have them review her personal statement. She gave her professors ample time to write reference letters and reminded them of the due dates.

This fall, Colarossi will attend Colorado State University in Fort Collins to earn a master's degree in material science engineering.

"The most exciting thing is that I know what I'm doing for the next two years of my life," she says. That's especially true given how her senior year ended. As COVID-19 swept the nation, Colarossi stayed on campus to finish her senior research while most of her friends and classmates went home.

"Living in East Campus, there isn't a common space to see people, so sometimes I went a full week without interacting with anyone beyond the Commons workers when I went to pick up my food," she says. "I thought that, as an introvert, I would be OK, but as the weeks went on, it was honestly very hard. I missed my friends and our weekly habits, my teammates and practices, and the in-person classes and labs."

Eventually she found a friend to run with; she also made time to video-call her cross country teammates and Bible study friends. Still, when she wrapped up her classes and graduated, she didn't feel the closure she wanted with friends and faculty.

"It wasn't how I'd choose to end the semester," she says. "I learned that though I am capable of doing some things by myself, I learn so much more through spending time with others."

Just as Colarossi was drawn to Dordt because of the sense of community she experienced during a visit, she leaves campus with a greater appreciation and longing for being with others.

"Simply because I can do something alone does not mean that is the best way, for my own sake or for others," she says. "We're all part of the body of Christ; we all make up classes, teams, and friend groups together."

### **Bryce Andry**

When Bryce Andry visited Dordt for the first time, he knew he wanted to play hockey.

“Being able to meet and practice with my future hockey teammates sealed the deal,” says Andry. “Everyone at Dordt was so welcoming to me.”



In addition to being a chemistry major, Bryce Andry was a goalie all four years at Dordt.

Andry was a goalie all four years of his college career. That sense of dedication and drive he had on the ice showed up in the classroom, too. After majoring in biology with plans to study pre-physical therapy, he switched to a chemistry major with plans to go to pharmacy school.

“During college, I looked at many occupations in the sciences, such as a general surgeon, physical therapist, and physician’s assistant. Nothing compared to when I shadowed at a small community pharmacy during my sophomore year of college. I enjoyed the attention to detail and the vast knowledge of medications that pharmacists possess.”

What stood out most to Andry during that internship experience was how much the pharmacists he worked with cared about the patients in their small community. Their kindness and generosity inspired him to dream about a future where he might run his own small pharmacy.

So, he focused his energies on preparing for pharmacy school. He took many chemistry classes, but his favorites were Instrumental Analysis, Biochemistry, and Senior Research. He also loved interacting with his chemistry professors.

“Each of them possesses a passion for chemistry in light of its place in God’s kingdom,” he says. “Dordt faculty have compassion for students and are motivated to help us achieve our academic goals even beyond classes at Dordt.”

He began applying to pharmacy schools during his junior year. “Because I have a good relationship with the professors, it wasn’t very difficult to ask them for letters of recommendation for pharmacy school,” he says.

And then, during the summer after his junior year, Andry studied for the Pharmacy College Admission Test (PCAT) while juggling a 30-hour work week as a pharmacy technician. During that hectic summer, he found it beneficial to schedule time to be with God in Scripture, prayer, and worship.

“Having the reassurance that God provides peace to those who seek him in times of overwhelming stress helped me most of all in preparing for the test.”

Senior year was extremely busy for Andry. He took 18 credits during the fall and spring semesters, all while attending hockey practice three times a week, playing hockey games most weekends between October through February, and volunteering one night a week to coach youth hockey goalies in Sioux Center.

Being busy didn’t slow him down when it came to academic success. He took the PCAT in the fall and scored in the 99th percentile of the chemistry portion and in the 89th percentile overall. He also prepared for interviews with three pharmacy school programs.

“During senior year, each day was a little different, depending on which classes I had or how soon an upcoming assignment, hockey game, test, or interview was scheduled,” he says. “I found success in planning each day as it came and was blessed by God with good friends and study breaks that helped me through the stresses of academics.”

In the end, he decided to attend pharmacy school at the University of Iowa. During the spring semester, he logged 180 hours of senior research. When COVID-19 hit, he was able to stay on campus and finish his research.

“The adjustment to online definitely took some getting used to,” he says. He missed interacting with his classmates through in-person discussion. Still, he was glad he could stick around campus to finish up his senior year.

Looking ahead to the fall, Andry is excited about pharmacy school.

“I’m most excited to begin learning the intricacies of patient care in the pharmacy setting and practice,” he says. “It’s such a blessing that God has revealed to us unique, subtle,



and fascinating ways to improve livelihoods, treat diseases, and utilize his creation to care for all his people.”

### **Aidan Bender**

Aidan Bender knew he wanted to attend Dordt after he stayed overnight on a campus visit.

“The students that were hosting me made me feel like I was part of the community, and I’d only been hanging out with them for a few hours,” he says. “Dordt felt like home to me.”

He also knew he could study chemistry and engineering at Dordt and that he could participate in theatre productions, all of which helped to convince him to move from Osage, Iowa, to Sioux Center.

“I began as a chemical engineering major, where I had to take core engineering courses, a few chemistry classes, and a few specialized engineering classes,” he says. “Eventually, I realized I didn’t care for the specialized engineering courses and that I wanted to take more chemistry courses.”

During his sophomore year, he switched to a double major in engineering science and chemistry. Both majors had smaller class sizes, which he appreciated. Whether working on homework or just hanging out in the chem room, he and his fellow chemistry majors got to know each other really well.

He also got to know his professors.

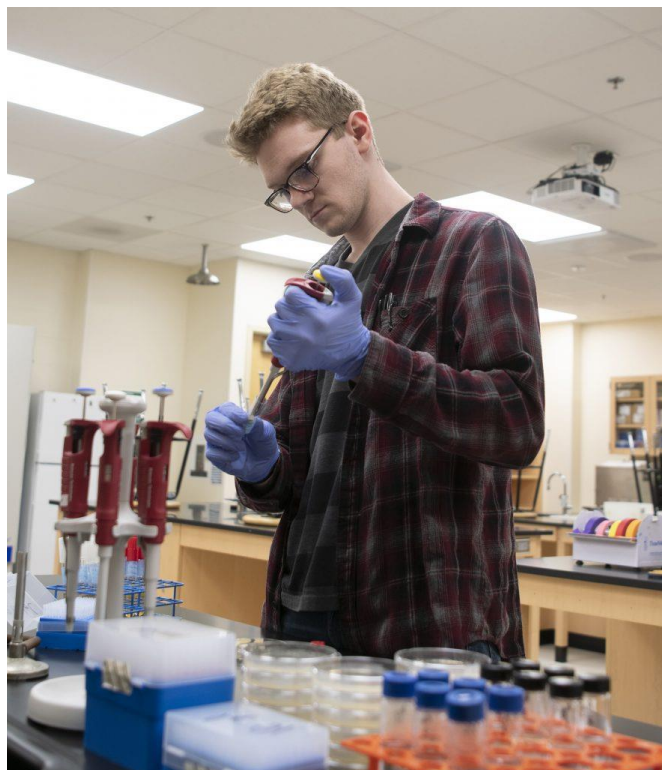
“What I really appreciate about Dordt professors is that their doors are always open. I can just walk into their offices and ask a question about anything, and they’ll stop and take the time to answer it.”

Dr. Joshua Zhu, a chemistry professor at Dordt, took time to talk with Bender about graduate school. Zhu had just completed a Ph.D. program when Bender was a sophomore; he had spoken with Bender about his dissertation.

“I had a lot of knowledge of what Dr. Zhu’s journey was like, and while his interests were more in pharmaceuticals than what I ended up focusing on, talking with him sparked the

idea that I could go to school for a little longer and do something like what Dr. Zhu is doing.”

As an engineering major, he had heard about and was intrigued by nanotechnology, or technology on an intensely small scale. Nanomedicine tied in medicinal chemistry with his interest in nanotechnology, so Bender decided to pursue that.



Despite the pandemic, Aidan Bender was able to keep working in the lab to complete his senior research project.

During the summer of his junior year, he studied for and took the GRE. He had chosen six different universities around the country to apply to. He began the applications in August and finished them up by September.

After being accepted to several institutions, he chose a Ph.D. program in nuclear engineering with an emphasis in medical applications at the University of Utah.

“Initially, I wasn’t looking at the University of Utah at all,” says Bender. “Dr. Ethan Brue, an engineering professor at Dordt, reached out to me and said, ‘I know a professor who is looking for students to conduct research. You should reach out to her. Here’s her contact information.’ So I contacted her and ended up applying to the University of Utah, and that’s where I’ve decided to attend.”

“Usually your first year of graduate school, you don’t have a professor, and then you pick them at the end of your first year,” says Bender. “Knowing that I will conduct research under this particular professor has put me at ease.”

Bender is looking forward to beginning research in nuclear medicine.

“I’m most excited to get into a lab and dedicate my time to research. Being able to be in the lab for 20 hours a week and 40 hours in the summers – I’m excited for that, as it’s the hands-on learning that I love most about chemistry. I enjoy pouring chemicals into beakers and seeing what they do, rather than staring at a whiteboard as professors write numbers on it.”

His advice for college students? Don’t be afraid to switch your major.

“It’s OK to switch your major. It’s OK to not know what you want right away. If you think you’re interested in something, try it, because you might like it. I didn’t think I wanted to be a chemistry major, but when I started taking chemistry classes, that’s when I realized that’s what I really wanted to do.”

Looking back at his Dordt experience, Bender says his senior year taught him confidence and self-motivation. In particular, he gained self-motivation thanks to COVID-19 and quarantine.

“While keeping myself to a schedule and having good time management were skills I’d already learned, losing the accountability from peers forced me to take that time management and self-motivation to a new level. Being stuck at home meant holding myself accountable to get homework done, investing time and effort into projects and papers, and sequestering quality time for classes, meetings, and work.”

The first part of his senior year gave him the confidence he needs to step into the next chapter of his life.

“My four years at Dordt prepared me well. Receiving graduate school offers from four universities, working as a TA, and maintaining good grades through new, more challenging subjects showed me that I hadn’t just temporarily memorized answers in previous years; the classes and experiences at Dordt did, in fact, teach me, and equip me.”