



INFINITE POSSIBILITIES
Profiles of Summer Research

THE GATTON
ACADEMY 
of Mathematics and Science

*Volume Thirteen
Summer 2024*



THE GATTON ACADEMY *of Mathematics and Science*

Infinite Possibilities:
Profiles of Summer Research from
The Gatton Academy of
Mathematics and Science in Kentucky
Volume Thirteen – Summer 2024

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ABOUT THE GATTON RESEARCH INTERNSHIP GRANT PROGRAM

The Gatton Academy of Mathematics and Science in Kentucky created the Gatton Research Internship Grant (RIG) in 2010. Made possible from a gift from Mr. Carol Martin “Bill” Gatton, the program offers grants to Gatton Academy students between their junior and senior years to support summer research internships across Kentucky, the USA, and the world. By providing funding, the program directly creates research internships that otherwise would not have existed for Gatton Academy students. In its 15-year history, the program has created 239 research internships for students to study STEM problems in their areas of interest in devoted, full-time research settings. Each year, the research funded by the RIG program yields significant outcomes for recipients. Recipients for the summer of 2024 completed their RIGs in various locations: WKU; Vanderbilt University in Nashville, TN; Yale University in New Haven, CT; Boston University in Boston, MA; Coastal Carolina University in Conway, SC; University of Louisville; and the University of Kentucky. Each has plans for submitting their research to competitions, conferences, and/or academic journals for publications, just as 2023’s recipients did. A sampling of the 2023 recipients’ achievements includes:



Tobi Akangbe, who presented her research, “Does sex affect neuromuscular and motor coordination of mice in response to sleep fragmentation?” at the KY INBRE Annual Research Conference, Lexington, KY.



Mykah Carden, who presented her research, “Geological and hydrogeological ‘red flags’ that influence land-use hazards in karst: A case study in Warren County, KY” at the American Junior Academy of Science Annual Meeting, Denver, CO. Mykah was named a 2024 Goldwater Scholar, arguably the most prestigious undergraduate research award.



Landon Carlton, who presented his research, “Exploring the contributions of v-type ATPase to drosophila melanogaster wing development” at the 22nd Annual Posters-at-the-Capitol Event, Frankfort, KY, where he gave the lightning talk for WKU.



Nikhil Kumar, who presented his research, “Shedding light on cancer by exploring the influence of bem1, boi1, and boi2 proteins on the elm1 protein kinase-mediated cell shape control in *saccharomyces cerevisiae*” at the KY INBRE Annual Research Conference, Lexington, KY.



Jacob Ladwig, who presented his research, “Self-assembled heterodinuclear metal organic coordination polymers constructed from Ruthenium(II) and 3d transition metal(II) polypyridyl complexes” at the American Chemical Society Spring 2024 Conference, New Orleans, LA.



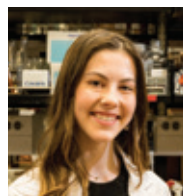
Sara Nath, who presented her research, “Classifying Alzheimer’s Disease outcome in single-cell RNA-seq datasets” at the American Junior Academy of Science Annual Meeting, Denver, CO.



Mara Neace, who presented her research, “Assessing water quality trends in the Jennings Creek & Lost River watershed to develop a watershed-based plan in Bowling Green, Kentucky” at the WKU Student Scholar Showcase, Bowling Green, KY.



Amy Pan, who presented her research, “iEquity: An augmented reality theatre production” at the Louisville Regional Science & Engineering Fair, Louisville, KY, where she received 1st Place in her category: Technology Enhances Art.



Sofia Sileo, who presented her research, “TribbleTrouble: A novel k3 phage with therapeutic potential” at the 25th Biennial Evergreen International Phage Meeting, Olympia, WA.



Vivianna Weaver, who presented her research, “Understanding the impact of environmental pollution on brain and vascular systems on the zebrafish model, *Danio Rerio*” at the American Junior Academy of Science Annual Meeting, Denver, CO.



This year the Gatton Research Internship Grant program funded 23 rising high school seniors during the summer of 2024. The following pages feature these students.

The Gatton Academy's Research Internship Grant provides students with remarkable opportunities for growth each summer. They learn networking and communication skills as they reach out to university faculty inquiring about positions on the faculty's research teams. Students problem-solve as they figure out the logistics of housing, meals, and transportation near the research facilities, or how they will manage their time if commuting from home or working remotely. During their summer experiences, they learn to be part of a research team and often navigate being the youngest members of their teams. Most students live away from home and further develop the independent living skills they started in Gatton's residence hall. Of course, they also develop extensive knowledge in their research fields.

In the summer of 2024, students worked on a wide variety of research topics. Students examined the regeneration of lamprey spinal cords, reducing friction on prosthetic devices, diabetes processes, renal cyst pathology, sustainable architecture, and more. Thanks to faculty mentors at Western Kentucky University, University of Louisville, University of Kentucky, Boston

University, Vanderbilt University, Yale University, and Coastal Carolina University, Gatton students were able to further develop their research skills and contribute to our collective knowledge.



LETTER FROM THE DIRECTOR

The Gatton Academy is able to provide students with these summer grants and staff support thanks to the generosity of Mr. Bill Gatton whose initial investment in The Gatton Academy established an endowment for research. The contributions of additional donors and the operational investment from the Kentucky General Assembly have enabled the Research Internship Grant program to thrive. Summer research experiences are key to students exploring career options, developing core workforce skills, and honing their interests in STEM fields. We are grateful to Mr. Gatton and all our donors and partners who have made these experiences possible.

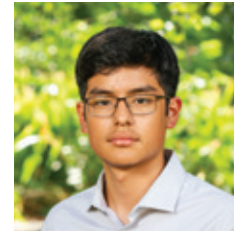
With gratitude,

A handwritten signature in black ink that reads "L. Breedlove".

Lynette Breedlove, Ph.D.

Director

2024
RESEARCH
INTERNSHIP
GRANT
RECIPIENTS



THE GATTON
ACADEMY 
of Mathematics and Science





Ibrahim Ali

*Bowling Green, Kentucky
(Warren County)*



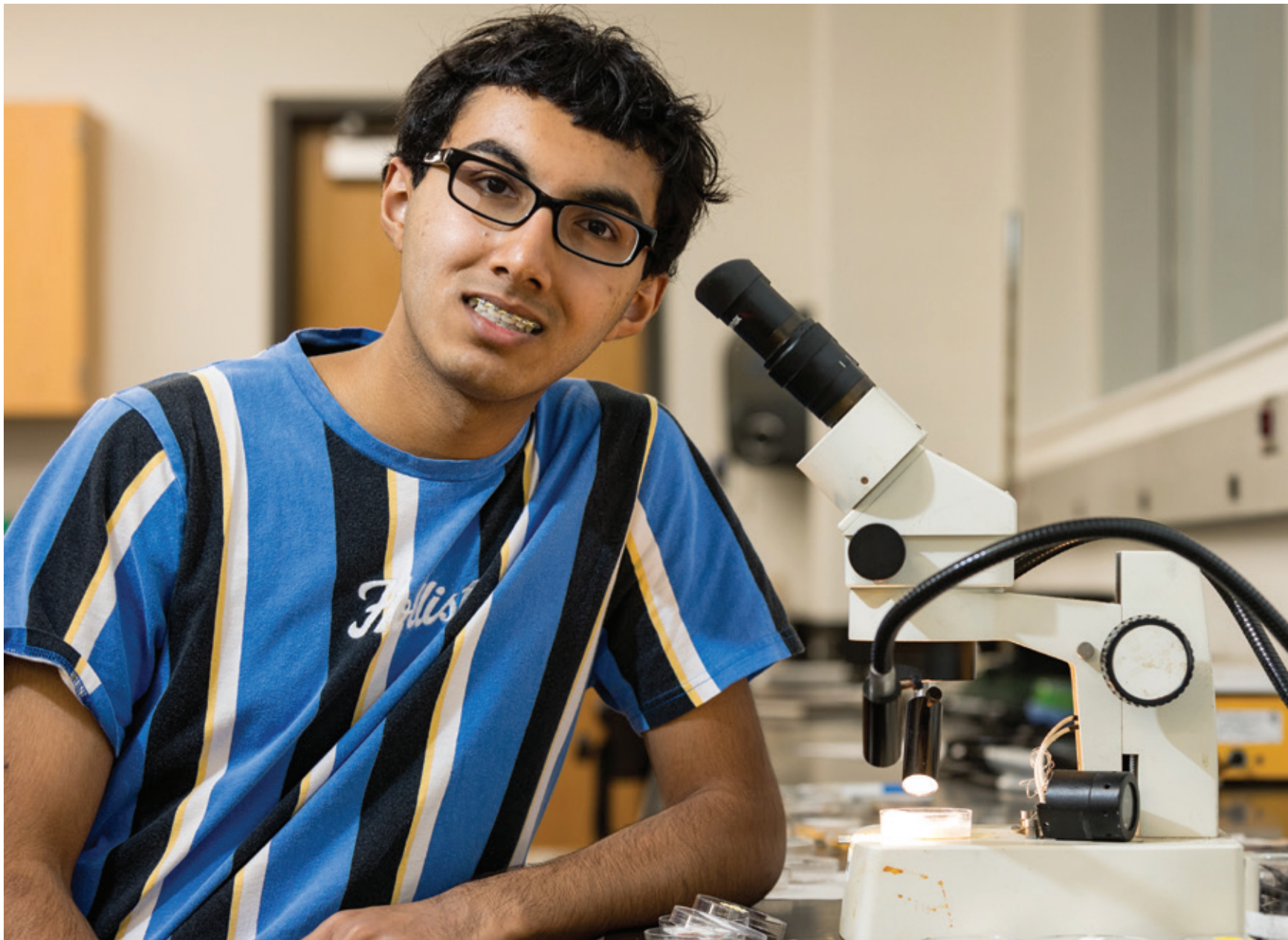
Dear Gatton Supporter,

I've known for a long time that I wanted to work in a STEM field, but I've always had a hard time choosing which one. It wasn't until I arrived at Gatton that I was able to have the resources and opportunities to explore what I wanted to do as my career. Before Gatton, the only experiences I had with STEM were science and math classes at my school. Although those classes did help when considering a field to choose, participating in research and being surrounded by peers knowledgeable in STEM helped fill in a lot of gaps.

The Gatton Research Internship Grant is one of the ways that I've been able to learn more about STEM. It has allowed me to participate in real lab research over the summer. Because of this opportunity, I have been able to learn more about the ins and outs of research and all the different aspects that it entails. The project I've been working on this summer involves synthesizing a new material, inspired by the enzyme carbonic anhydrase, that converts carbon dioxide into bicarbonate, which could help mitigate carbon emissions. Through this opportunity I have gained more knowledge in the area of chemistry, learned more about what a career in chemistry might look like, and learned more about the scientific process. More importantly, by challenging myself through this research experience, I have gained confidence in my abilities. I am very grateful for your help in giving me this opportunity.

Sincerely,

Ibrahim Ali





IBRAHIM ALI

HOMETOWN
Bowling Green

HOME COUNTY
Warren

HOME HIGH SCHOOL
South Warren High School

RESEARCH AREA
Chemistry

RESEARCH TITLE
Synthesizing Metal
Organic Frameworks to Mimic
Carbonic Anhydrase

CAREER GOAL
Mechanical Engineer

EXTRACURRICULAR ACTIVITIES
Gatton Academy Medical
Association, Philosophy Club

“The moment I realized STEM was my passion was when I was twelve years old, trying to learn how computers worked. It always seemed like magic how they worked, but learning about what went on inside the CPU made computers seem more magical than less, and that was when I realized that STEM is something I could really want to do.”

“This research experience fits into my educational and professional goals by giving me a chance to work in STEM in a professional setting. With that experience, I will be able to better know what a career in STEM will look like, as well as develop connections and have something to add to my resume.”

“Probably my favorite Gatton Academy memory to date is when my floor went to get hot dogs in the middle of the night. What started it was that I was hungry, but there were no restaurants open on campus; however, I did find this one hot dog place open downtown. Gattton requires that at least three other people have to go with you if you want to travel off campus at night, so I was worried I wouldn’t get enough people to go, but in a strange turn of events, people just kept showing up until it was almost my whole floor going to this one hot dog place.”

A portrait of a young woman with long brown hair and freckles, smiling. She is wearing a red top with white polka dots and a gold necklace. The background is a blurred green garden. A green curved banner is at the bottom, and a green circle with the number 10 is in the bottom left corner.

Bailey Amyx

*Paducah, Kentucky
(McCracken County)*



Dear Gatton Supporter,

I want to sincerely thank you for contributing to Gatton and giving me the opportunity to conduct my research this summer. I knew from an early age that I wanted a medical career. Figuring out what that career was, though, proved challenging. What helped the most was when I had a spinal fusion at the ripe age of thirteen. This made me want to be a pediatric neurosurgeon. Of course, there is a big difference between thinking you want to do something without knowing anything about it and then actually doing it. Luckily, my research this summer was on spinal cords in sea lampreys. I spent the summer dissecting, sectioning, and imaging the spinal cords! Staying in Bowling Green also allowed me to explore the city I will hopefully be spending the next several years of my life in. After Gatton, I want to go to college at Western Kentucky University and go to medical school at the University of Kentucky's College of Medicine's Bowling Green campus. Overall, this amazing summer opportunity helped me solidify the path for my future and helped me to confirm that it is truly something I want to do. For helping me do that, you have my deepest gratitude.

Sincerely,

Bailey Amyx





BAILEY AMYX

HOMETOWN

Paducah

HOME COUNTY

McCracken

HOME HIGH SCHOOL

McCracken County High School

RESEARCH AREA

Biology

RESEARCH TITLE

Examining the Role of CJun
in Spinal Cord Regeneration

CAREER GOAL

Pediatric Neurosurgeon

EXTRACURRICULAR ACTIVITIES

Future Health Professionals
(HOSA) Club, Prom Team 2024,
Bible Study Club, Card Club,
Humane Society Club,
Biology Club, Volleyball Club,
Soccer Club, Book Club

"I am most looking forward to having a research project that is truly my own and that I am fully responsible for. I am also really looking forward to being able to present my work and networking with some amazing scientists in the same or similar fields."

"The biggest challenge I will have to overcome in my research will be learning how to work in a lab professionally. While I know how to act professionally and do have some general lab etiquette, I have never worked in a lab 40 hours a week, so learning how to do that will be a struggle."

"The biggest change I have experienced here at Gatton so far has been the amount of studying I have had to do. I used to be able to pass all of my classes without studying, but when I came to Gatton, my classes became significantly harder, and I had to learn to adjust accordingly."

A portrait of a young woman with long dark hair, wearing glasses and a black top, smiling. The background is a blurred outdoor setting with green plants and a stone wall. A green curved banner is at the bottom, and a green circle with the number 14 is in the bottom left corner.

Aanyaa Arora

*Bowling Green, Kentucky
(Warren County)*



Dear Gatton Supporter,

I am very grateful for your support, which allows students like me to immerse themselves in such unique and impressive opportunities. I was born in India, and my family immigrated to the United States in 2013. Like any other immigrant, my parents came here for the American Dream—to provide their children with the best opportunities possible. Thanks to The Gatton Academy, I have been able to experience countless opportunities.

Thanks to your support, I was able to pursue what initially attracted me to Gatton. This summer, I conducted research with Dr. Joseph Marquardt at Western Kentucky University. My research focuses on *Saccharomyces cerevisiae* (budding yeast) and how polarity proteins like Boi1 and the Mitotic Exit Network help regulate cell shape and cell cycle events. Since yeast shares many biological processes with humans, we study it to understand what happens when these processes go wrong. With this information, we can ultimately learn more about the mutations that cause cancer and other diseases.

The Gatton Academy has not only challenged me but has also helped me grow. Whether tackling computer science or conducting research, I have learned so much academically and about myself. I have also had the chance to become friends with many like-minded people and have made memories that will last a lifetime. Through classes, research, volunteering, and clubs, Gatton has not only reinforced my love for STEM but has also helped me decide that becoming a physician is the right choice for me.

Sincerely,

Aanyaa Arora





AANYAA ARORA

HOMETOWN

Bowling Green

HOME COUNTY

Warren

HOME HIGH SCHOOL

Greenwood High School

RESEARCH AREA

Molecular Biology

RESEARCH TITLE

Investigating the regulation of cell cycle events and cell shape by polarity protein Boi1 and the mitotic exit network in budding yeast

CAREER GOAL

Pediatric Cardio-Oncologist

EXTRACURRICULAR ACTIVITIES

Gatton Academy Medical Association, Kentucky Youth Association, Science-Minded Kids, Biology Club, Asian American Pacific Islander Association, Gatton Academy Leaders in Education, Health Occupations Students of America

“My best super-nerd moment was in fifth grade at Super Saturdays. I got to hold a pig’s heart and while it grossed out some people, I was completely fascinated and found it to be an amazing experience. That moment sparked my passion for biology and solidified my love for STEM.”

“During my first year at The Gatton Academy, the most notable change I’ve experienced is in my ability to confront and overcome new challenges. Whether it’s been handling demanding coursework, engaging in research, or navigating personal obstacles, The Gatton Academy has played a pivotal role in helping me tackle these challenges head-on.”

“To me, as a young person interested in STEM, research represents a pathway to make a meaningful impact. Through experiences like Genome, I’ve come to understand the profound influence that insights from research can have on shaping our world. My involvement in summer research is driven by a desire to contribute positively, leveraging the insights gained to address real-world challenges and advance scientific understanding.”

A portrait of a young woman with long brown hair and blue eyes, wearing a white cable-knit sweater. She is smiling slightly and looking towards the camera. The background is a blurred outdoor setting with green foliage and a stone wall. A green curved graphic element is in the top right corner, and a white curved graphic element is in the bottom left corner.

Luna Asbell

*Shepherdsville, Kentucky
(Bullitt County)*



Dear Gatton Supporter,

I first want to thank you for everything you do to support The Gatton Academy. Your contributions have ensured that many people from lower income backgrounds and first-generation students, like me, have the ability to pursue a college education at minimal cost. This applies not only as we are Gatton students, but later on when we are pursuing the rest of our undergraduate and likely graduate degrees.

I especially want to thank you for the opportunity to participate in the Gatton Research Internship Grant (RIG) program. I was able to complete research at the University of Louisville over the summer where I gained experience being in a wet lab and working with equipment like NMRs and various types of lasers. I was also able to grow my network with professionals in the field I want to pursue (Chemistry) and learn more about the process of applying and working as a graduate student.

Attending The Gatton Academy has allowed me to better prepare for living on my own in the future. For instance, it has taught me to set – and stick with – a schedule and to eat at normal intervals. It has also opened my eyes to future career opportunities. I would not have been able to gain these experiences without the support you give to Gatton, so, as a current Gatton student and a future chemistry researcher, I thank you.

Sincerely,

Luna Asbell

"I am looking forward to taking part in Dr. Wilson's lab and networking with people who have common interests. Dr. Wilson's research is a lot different from what I am doing right now in my current chemistry lab, so I am really excited to try something new."

"The biggest challenge in my research will be having to go through training to learn how to safely use a laser. I have never used a laser before, so I am really interested in learning how it works and the data I will be collecting from it."

"My favorite Gatton Academy memory must be either GROWeek dance or prom. The Staff give you an opportunity to just relax for a bit and not worry about what you have to do later."

LUNA ASBELL

HOMETOWN

Shepherdsville

HOME COUNTY

Bullitt

HOME HIGH SCHOOL

Riverview Opportunity Center

RESEARCH AREA

Chemistry

RESEARCH TITLE

Finding the surface intermediates in the electrocatalytic reduction of carbon dioxide on copper and copper-silver alloy electrocatalysts

CAREER GOAL

Head researcher of my own chemistry lab

EXTRACURRICULAR ACTIVITIES

Reading, Humane Society, Russian Club





Mahmood Ateyeh

*Frankfort, Kentucky
(Franklin County)*



Dear Gatton Supporter,

After hearing about my two older brothers' experiences at Gatton, I was always excited to attend Gatton myself. Amongst the other aspects of Gatton, I was always drawn to pursuing research. I came from Frankfort, Kentucky, which had relatively few options for engaging with college-level faculty for a research project. Upon acceptance into Gatton and before I even stepped foot on Western Kentucky's campus, I eagerly emailed a professor to take on a project involving using light to kill bacteria. I was accepted into the lab, but it wasn't until the RIG that I was able to focus solely on pursuing my project. Over the summer, I learned more about topics that I am passionate about exploring in the future as I study medicine. I also built what will hopefully be life-long friendships with fellow researchers in my lab and got to present my research at the Kentucky Junior Academy of Science!

With my own story in mind, I understand the importance of initiatives like those at Gatton. Even in Gatton's relatively short lifespan, it has taken part in so many different stories of empowering people to reach their dreams. That's in great part to people willing to donate money, strength, and initiative to such programs. I'm very grateful for all of the people who contributed to helping me along this journey in any way.

Thanks,

Mahmood Ateyeh

"I'm looking forward to the awesome research and academic parts of the summer experience, but also getting to know more of Bowling Green."

"My biggest challenge is that some aspects of my projects have been worked on extensively, so significantly differentiating my work takes effort. Nonetheless, I hope to put in this effort to rise above expectations."

"While multiple things come to mind, my favorite Gatton moment has a nerdy answer; when Gatton got second at Science Bowl. We had been losing, but after some coaching we almost won the entire tournament."

MAHMOOD ATEYEH

HOMETOWN

Frankfort

HOME COUNTY

Franklin

HOME HIGH SCHOOL

Western Hills High School

RESEARCH AREA

Biology

RESEARCH TITLE

Improving the Efficacy of
Photo-Deactivation Therapy
with Methylene Blue
as the Photosensitizer

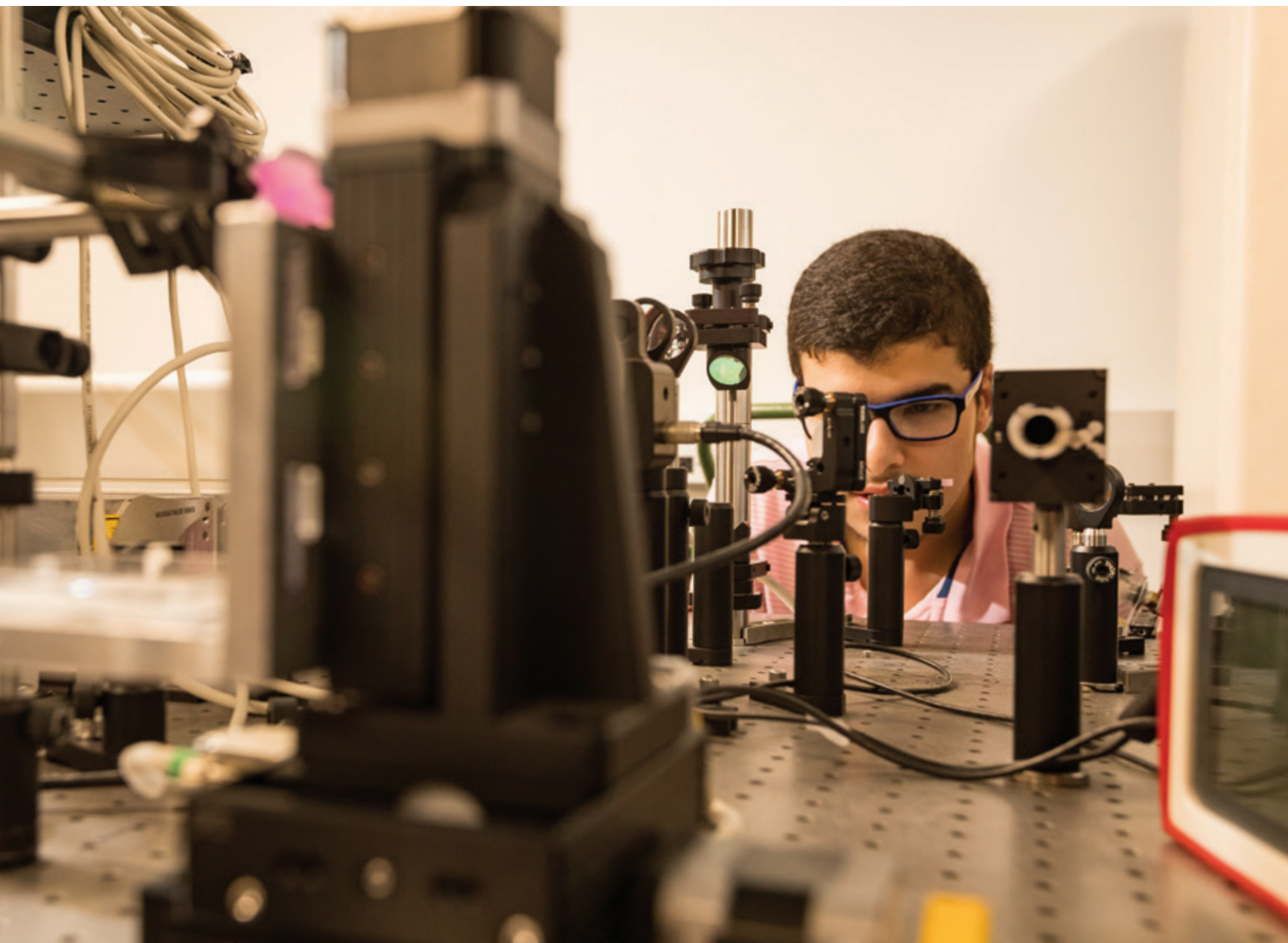
CAREER GOAL

Medical Doctor

EXTRACURRICULAR ACTIVITIES

Science Bowl, Chemistry Club,
Biology Club, Computer Science Club,
Basketball Club





A portrait of a young woman with long, wavy brown hair and blue eyes, smiling gently. She is wearing a white button-down shirt and a small gold hoop earring. The background is a soft-focus outdoor scene with green foliage and yellow flowers. A green curved banner is at the bottom, and a green circle with the number 26 is in the bottom left corner.

Ava Blackledge

*Morehead, Kentucky
(Rowan County)*



Dear Gatton Supporter,

I can say with confidence that The Gatton Academy has changed my life for the better. Though I come from a long line of college graduates, with my parents both having PhDs, I had no idea what I wanted to study in college. I had an affinity for science, but it wasn't until I participated in Gatton's Genome course (BIOL 212) that I knew I wanted to pursue a career in molecular biology.

I come from a fairly rural part of Kentucky – Morehead – where the only experience I had with biology was a rudimentary Introduction to Biology class in my sophomore year. However, I was originally born in Figtree, New South Wales, Australia. My parents chose to live near Sydney to pursue their research careers as psychologists, and we moved to the United States when I was two years old to be closer to family. The importance of research and science has been instilled in me from a young age, but Gatton solidified my desire to have a research career and provided me with a unique summer research opportunity to kickstart this career.

I am participating in a molecular biology research opportunity this summer, mentored by the same professor who taught the Genome course. We are investigating interactions between the proteins of host bacteria and the proteins of the viruses that kill these bacteria. This research is establishing the foundation to produce a drug that could serve as an alternative to antibiotics. In addition to giving me a taste of a molecular biology research career, this research experience will be a pillar of my upcoming college applications. Thank you very much for your support!

Sincerely,

Ava Blackledge

“I am most looking forward to building a mentee/mentor relationship with my research mentor during my summer RIG. I find it wonderful that I now get to research with the person who introduced me to the field of microbiology and build on a long-standing project with real-world medical implications!”

“The biggest adjustment I’ve made in my first year at The Gatton Academy is increasing my independence and self-control. Although living four hours away from my family can be taxing, being at Gatton has provided me with the opportunity to significantly grow as a person, greatly increasing my ability to manage a high-stress workload and navigate experiences on my own.”

“As a young person in STEM, summer research gives me a glimpse into what being a principal investigator in a microbiology laboratory may look like. I would not have had such thorough exposure to the scientific process if I hadn’t participated in this RIG.”

AVA BLACKLEDGE

HOMETOWN

Morehead

HOME COUNTY

Rowan

HOME HIGH SCHOOL

Rowan County Senior High School

RESEARCH AREA

Microbiology

RESEARCH TITLE

Contributing to the Development
of a Novel Therapeutic for
Bacterial Antibiotic Resistance
by Investigating Bacteriophage
Genes with No Known Function

CAREER GOAL

To work at a government health
organization researching pathogens
and viruses with a Ph.D. in
Microbiology/ Virology

EXTRACURRICULAR ACTIVITIES

National History Day Competition,
RCSHS forensics team,
Gatton Academy Leaders in Education,
Women in STEM Club





A portrait of a young man with dark hair and glasses, wearing a light blue button-down shirt. He is standing in front of a blurred background of green foliage. A green curved banner is at the bottom of the image, containing his name and location. A green circle with the number 30 is in the bottom left corner.

Bruno Castaneda

*Smithfield, Kentucky
(Henry County)*



Dear Gatton Supporter,

Before coming to The Gatton Academy, my future in science was uncertain. I would be the first person in my family to pursue a STEM major. It was daunting coming from a high school with minimal STEM opportunities and no college classes. Everything changed when I came to The Gatton Academy. At Gatton, I delved into different scientific subjects and courses while also engaging in research this past summer. I had never conceived the number of accomplishments and goals I would achieve in such a short period, considering where I came from, and a great part of those successes are attributable to The Gatton Academy.

There have been days throughout my junior year that have been extremely challenging for personal or academic reasons. Nonetheless, I can confidently say that after each one of those obstacles, I have become a stronger individual. I remember the late nights, helping my friends with their calculus finals or the days when my senior friends would help me with chemistry. No matter where you come from, I have seen our school become a community and a family.

The research I was fortunate to be part of this summer relates to developing a device that can sense different gases and their concentrations. This might not seem important at first, but everywhere we go there are multiple gases, some of them being dangerous at certain concentrations. For this reason, a portable gas-sensing device is highly important in multiple industries and sectors to provide safety and productivity. This is just one of the experiences I have been provided at The Gatton Academy, but the list will keep growing as I continue through my senior year. The least I can say now is thank you for your support of STEM, our state, and society.

Sincerely,

Bruno Castaneda

“One afternoon after school, I was watching videos online when I stumbled upon a video on physics and the preconceptions humans have that are proven incorrect by current scientific theories made by a former CERN scientist. This video intrigued me to such an extent that it made me spend several hours that day and the following days looking more into the topics discussed.”

“It allows me to gain knowledge and experience in applied physics, which, due to my current career interests being physics and mathematics, provides invaluable resources for self-improvement, mainly in physics. Not only will it benefit the growth of my scientific knowledge, but it will also enable me to contribute to WKU’s Applied Physics department with the improvement of promising technologies made at WKU.”

“‘Do not try to learn all at once’ is the best advice I have received from my mentor. This quote resonates with me, as sometimes the thrill or rush for understanding ends up negatively affecting my performance and learning. For this reason, this quote is fixed in my mind to remind myself to be patient while pursuing my interests in order to achieve greater things.”

BRUNO CASTANEDA

HOMETOWN

Smithfield

HOME COUNTY

Henry

HOME HIGH SCHOOL

Henry County High School

RESEARCH AREA

Applied Physics

RESEARCH TITLE

Gas Chromatography studies
on Volatile Organic Compounds
and Complex molecules

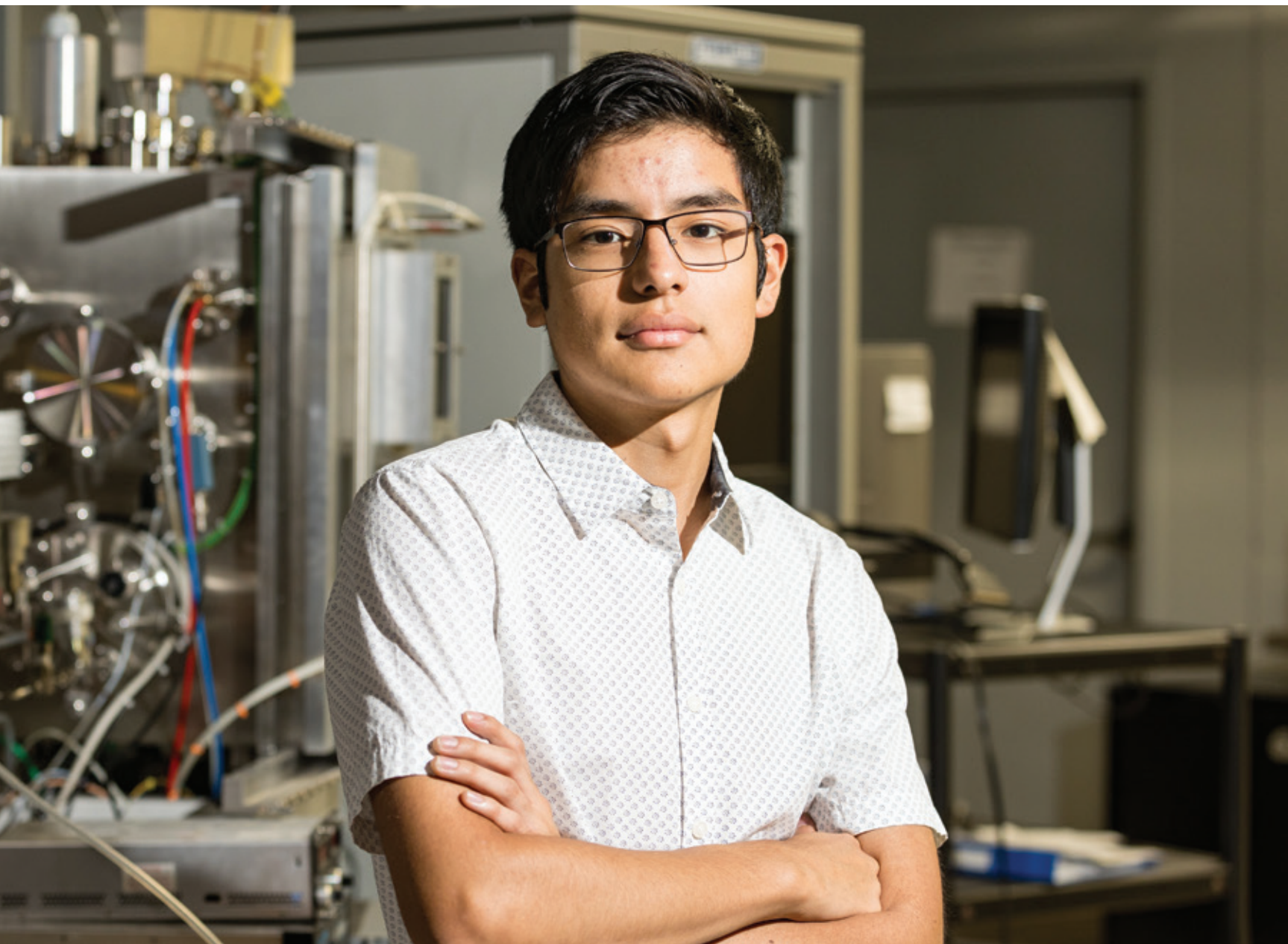
CAREER GOAL

Development and improvement
of current gas chromatography
devices for a novel application
in different industries

EXTRACURRICULAR ACTIVITIES

Mathematics independent
study, Astronomy Club,
playing guitar, sim racing





A portrait of a young man with dark hair and glasses, smiling. He is wearing a dark blue suit jacket, a light blue shirt, and a blue and black striped tie. The background is a blurred green landscape with trees and foliage. A green curved banner is at the top right, and a green banner with white text is at the bottom.

Alper Er

*Bowling Green, Kentucky
(Warren County)*



Dear Gatton Supporter,

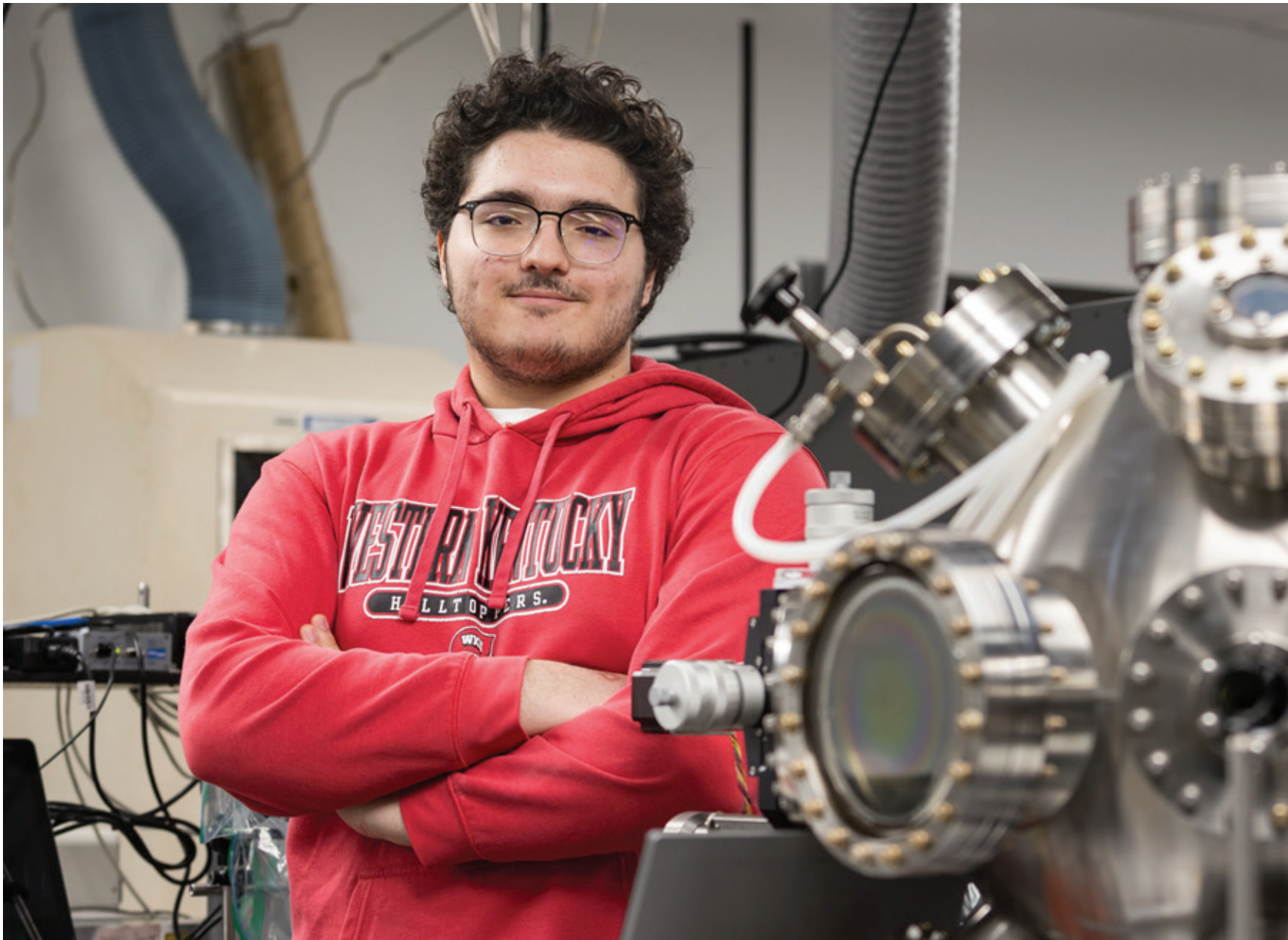
I want to sincerely thank you for your continued support, which has provided me with invaluable opportunities through the Gatton Research Internship Grant program. Your generosity has allowed me to engage in meaningful research at WKU, where I focused on Laser-Induced Periodic Surface Structures (LIPSS). This research has deepened my understanding of laser optics and its potential applications in enhancing prosthetics, with the goal of reducing friction and infections.

Throughout this experience, I have had the privilege of collaborating with a talented team of peers and mentors. Working alongside experienced faculty and researchers has been incredibly rewarding, allowing me to contribute to a complex project while learning from one another. This team-based approach has strengthened my communication, teamwork, and problem-solving skills, essential qualities that will serve me well in future academic and professional pursuits.

Your support has been instrumental in making this experience possible, and I am truly grateful for your dedication to empowering students like me. The skills and knowledge I've gained will undoubtedly shape my future and allow me to contribute meaningfully to the field of science and research. Thank you for believing in my potential and investing in my growth.

Sincerely,

Alper Er





ALPER ER

HOMETOWN

Bowling Green

HOME COUNTY

Warren

HOME HIGH SCHOOL

Bowling Green High School

RESEARCH AREA

Physics

RESEARCH TITLE

Formation of Picosecond
Laser-Induced Periodic Surface
Structures on Steel for Knee
Arthroplasty Prosthetics

CAREER GOAL

Medical, ideally neurosurgery

EXTRACURRICULAR ACTIVITIES

Soccer Club, Caucus Debate,
Card Club, Craft Club,
Academic Team, Volleyball Club,
Tutoring Chemistry, Tutoring Math,
Fitness Club, Chemistry Club,
Math Club

“My current research is based on alteration of prosthetics to eliminate or minimize infections. This ties very nicely into my goal of becoming a world-class neurosurgeon, as it is directly associated with the medical field, allowing me to interact with many doctors, and ask them for advice.”

“The best piece of advice I’ve received from my research mentor has been to keep my head down and work hard. He told me that the only thing I should worry about is how much work I’m putting in, and not about what others are doing, and that as long as I do my best, I’ll accomplish my goals.”

“The biggest change I’ve experienced since first coming to Gatton has been my attention to time. I’ve learned to control how I spend my time much more efficiently, so that I can do as many of the fun activities we are offered, while still performing well academically. I am very thankful that I learned this sooner rather than later, as it will be an essential skill for the rest of my life.”

A portrait of a young man with short, dark hair and glasses, smiling. He is wearing a dark blue polo shirt with a small red logo on the chest. The background is a blurred green landscape with trees and foliage. A green curved banner is at the top right, and a green banner with white text is at the bottom.

Gabriel Gooden

*Smithfield, Kentucky
(Oldham County)*



Dear Gatton Supporter,

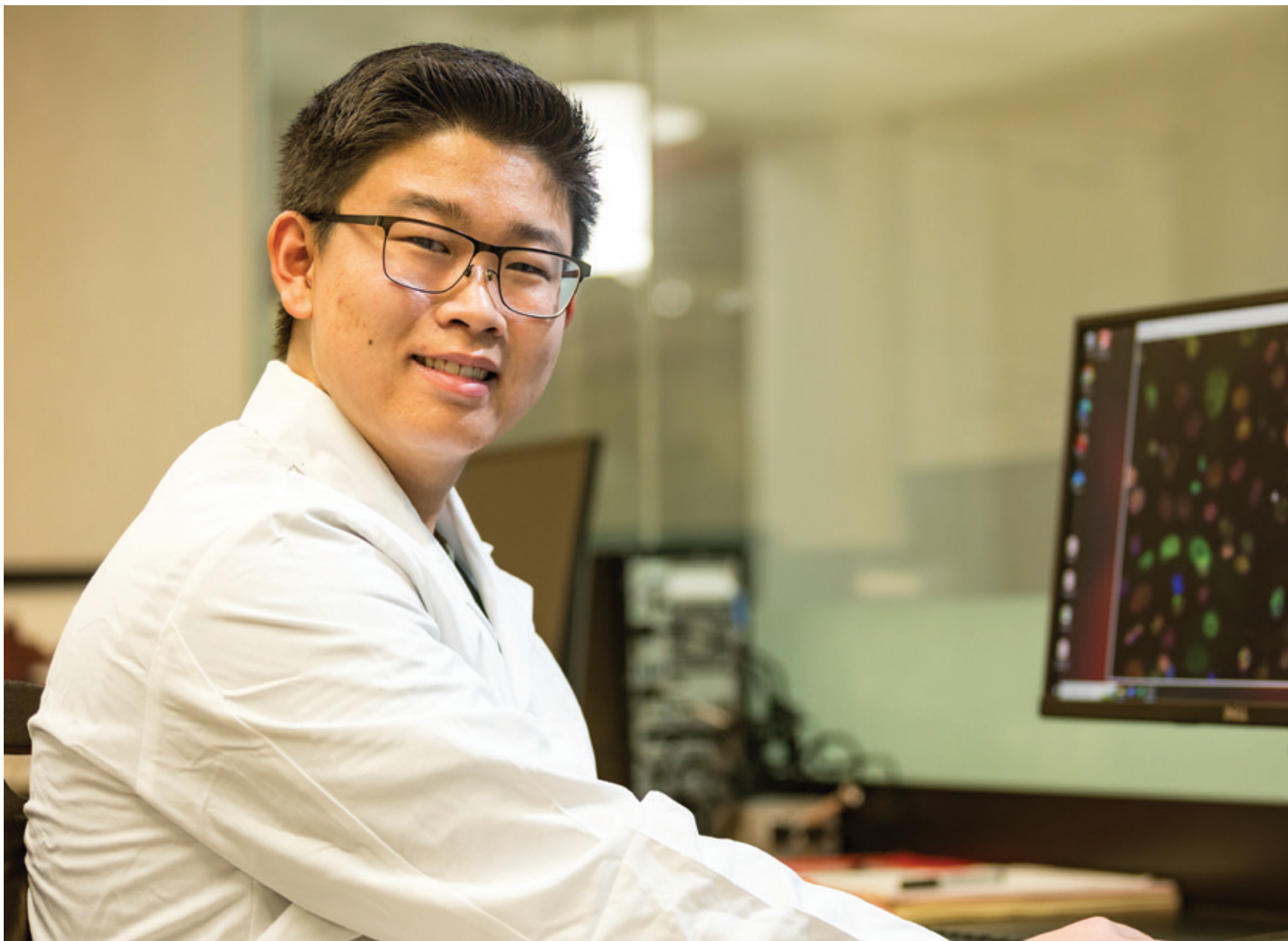
Growing up, I was always fascinated by the prospect of making scientific discoveries that could someday be used to help people in need of healthcare. I admired medical researchers for their dedication and sacrifice towards achieving the noblest of goals—perfecting the art of healing and building a better world one experiment at a time. To me, they were real life superheroes whose ranks I never could have imagined myself joining. Gatton has opened a multitude of doors for me to pursue my scientific passions that I never would have been able to pursue had I stayed at Oldham County High School.

This internship has been a once-in-a-lifetime experience and has given me the chance to contribute to the research community that has given us all so much. I've been able to step out of my comfort zone and into a professional scientific setting at zero cost. This reality is something that a younger version of myself could only dream of. I cannot thank you enough for the opportunity you have blessed me with.

This summer, I was able to conduct cancer and aging research at WKU for eight amazing weeks under the mentorship of Dr. Jason Stewart. During this time, I was taught advanced genetic and biomolecular experimental techniques as well as how to investigate and troubleshoot when things didn't go according to plan. Because of your generosity, I have been able to cultivate my love for biomedical research and make lasting memories that I'll cherish forever. The RIG has helped me develop my interest in the fields of genetics and cancer therapy as well as become more independent. This would not have been possible without your generous contribution. Thank you.

Sincerest gratitude,

Gabriel Gooden





GABRIEL GOODEN

HOMETOWN

Smithfield

HOME COUNTY

Oldham

HOME HIGH SCHOOL

Oldham County High School

RESEARCH AREA

Microbiology, molecular biology

RESEARCH TITLE

Role of CST in Telomere
Protection Characterization of
the relationship between CST
and Telomere Preservation Analysis
of CST and its relationship with
Telomere Preservation Analysis
of the Telomere protection
mechanism maintained by CST

CAREER GOAL

Medical Doctor

“I remember walking the dogs with my dad near the end of my sophomore year explaining genetic recombination to him. I recall being incredibly enthusiastic while I talked with him, and from that moment on I knew I wanted a career in biological science.”

“I would say that the biggest change I’ve experienced in my first year at Gatton is how I’ve adjusted to residential life. Having to coexist with over a dozen guys living on wing wasn’t something I was used to coming in. My compromising skills have improved much since GROWeek.”

“As a young person interested in STEM, research is the future. Take a look around the world and even your own life. We have come far, but still have so much potential to fix, improve, discover, and achieve. Research propels forward the threshold between what we know and what we don’t.”

A portrait of a young woman with long, wavy hair that is pink with orange and yellow highlights. She has freckles and is smiling slightly. She is wearing a white lace-trimmed top. The background is a blurred green outdoor setting. A green curved banner is at the bottom of the image, containing her name and location. A green circle with the number 42 is in the bottom left corner.

Katie Isaacs

*Hopkinsville, Kentucky
(Christian County)*



Dear Gatton Supporter,

I would like to thank you for giving me the opportunity to truly find myself this summer. After spending seven weeks living and working in Lexington, I am sure that a career in research is the right path for me. I was able to grow in my studies and become a part of something bigger than myself. I was able to contribute to the world by participating in nuclear physics research that will one day pave the path for more sustainable energy usage on earth. I wrote code for a future particle accelerator that will enable deeper investigation of fundamental particle interactions. Going to work every day with such a purpose in mind taught me responsibility and fulfilled my desire to remain productive while not in school. My research professor, the University of Kentucky's Dr. Fatemi, worked with me every day to understand the physics principles I was working with since I had not previously taken a physics class. I appreciate her willingness to work with me and her dedication to my future. We worked through a physics and a nuclear physics textbook, going over the concepts so I could use them properly in my code. The graduate students in the office helped me to learn how to set up the programs on my computer and provided support throughout my time there (thank you Hannah, Manny, and Dmitri). I have learned skills such as perseverance and problem solving that I will be able to apply in future jobs and for the rest of my life.

Thank you,

Katie Isaacs





KATIE ISAACS

HOMETOWN

Hopkinsville

HOME COUNTY

Christian

HOME HIGH SCHOOL

University Heights Academy

RESEARCH AREA

Chemical Physics

RESEARCH TITLE

Feasibility of performing an
energy-energy correlator (EEC)
measurement at the future
Electron Ion Collider

CAREER GOAL

Nuclear Physicist

EXTRACURRICULAR ACTIVITIES

Gatton Academy Leaders in
Education, Academic Team,
Beta, NHS, Key Club, Student Y

"I realized my passion was in STEM when I started buying used textbooks and reading them to learn more about Physics and Chemistry."

"This research is in a field that is not currently being worked on at WKU. I hope to eventually develop a career in nuclear chemistry, which is the context of this research. This way, I can begin doing research in an area I'm passionate about before I finish high school."

"The best advice my mentor has given me is to carefully consider all of my options in life. There will be many opportunities and paths to take, and I should always do what is best for me and my goals."

A portrait of a young man with long dark hair and glasses, smiling. He is wearing a blue button-down shirt. The background is a blurred green garden. A green curved banner is at the bottom, and a green triangle is in the top right corner.

Nihal Jacob

*Crestwood, Kentucky
(Oldham County)*



Dear Gatton Supporter,

I am from Crestwood, in the Greater Louisville Area. There, I knew somewhat that I wanted to pursue medicine. With no community of like-minded future physicians, I hardly knew what coursework in college would look like, or what came after med school, or even what I wanted to do with my free time in high school. At The Gatton Academy, I was able to explore interests in the fields of chemistry, biology, and mathematics, and, more importantly, learned that these did not exist in separate bubbles.

Amongst more knowledgeable WKU undergraduates and passionate fellow Gatton students, I learned how to develop my path towards medicine. I deferred from an initial aim towards neuroscience, seeking now to become a physician-scientist and produce therapies to help more than one patient at a time. By taking high-level courses, I will be able to complete my undergraduate degree years sooner before I pursue an MD-PhD.

Initially, I was extremely intimidated by doing research at Gatton. However, through the Genome Discovery and Exploration Program, I learned that I loved lab work and inquiry processes, which inspired me to pursue a career involving research. I joined a lab at WKU and spent my summer investigating insulin signaling mechanisms at the Univ. of Kentucky.

I am certain that the self-discovery I encountered at The Gatton Academy couldn't have happened at any other school in Kentucky. I am grateful for the opportunities for engaging in research, exploring the greater STEM fields, and progressing my career goals.

Thank you for your support,

Nihal Jacob

“This summer, I will have to learn to work with computational biology tools for protein structure prediction and immediately apply these skills to designing a small inhibitor molecule. I will have to do this with limited CS experience and limited knowledge of protein folding, so in the entire project, I am least knowledgeable in this area.”

“The best advice my mentor has given me is to dive headfirst into the project early, including trying to better understand the software I will be working with, reading surrounding literature that may be relevant, and studying common procedures associated with this kind of work. Although there were three projects to choose from for my RIG, my mentor heavily encouraged me to work hard to be able to do more than one, which is contrary to the common message that I often hear: ‘You can’t do it all.’”

“My favorite Gatton Academy memory to date was singing at 3 a.m. with friends while finishing up work that the day didn’t have time for. It’s nice knowing that at Gatton there are always a few people in the same boat as you when you’re pressed for time and stressed about deadlines.”

NIHAL JACOB

HOMETOWN

Crestwood

HOME COUNTY

Oldham

HOME HIGH SCHOOL

South Oldham High School

RESEARCH AREA

Myogenesis

RESEARCH TITLE

Associations between
PASK Expression in Myocytes
and Insulin Resistance

CAREER GOAL

Neurosurgery

EXTRACURRICULAR ACTIVITIES

Quizbowl, Chemistry Club,
Biology Club, Coding++ Club,
Gatton Academy Medical Association,
Math Club, WKU Community Band,
Gatton Swim Club





A portrait of a young man with dark hair and freckles, wearing a black collared shirt. He is looking slightly to the left of the camera. The background is a blurred outdoor scene with green foliage and a stone wall. A green curved graphic element is in the top right corner, and a white curved graphic element is in the bottom left corner.

Juwon Joung

*Wilmore, Kentucky
(Jessamine County)*



Dear Gatton Supporter,

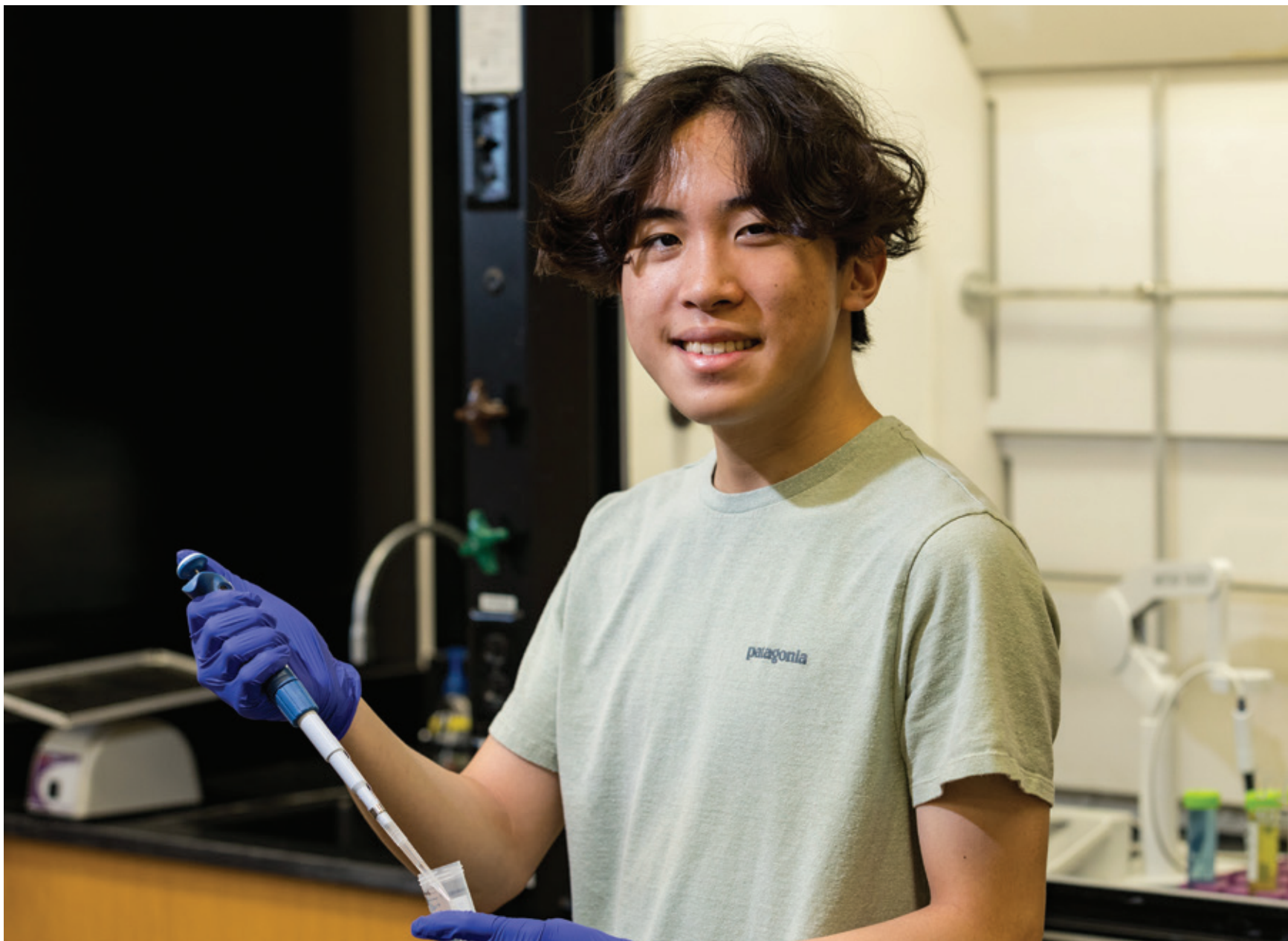
My name is Juwon Joung, and I am from the Jessamine County School district. During my time attending school in Jessamine County, my knowledge of the amazing opportunities that were available to high school students was limited to what was present in my environment, and unfortunately not many opportunities were available. However, attending The Gatton Academy has helped me to realize the infinite number of possibilities that exist.

Through The Gatton Academy, I was able to conduct research this past year in the field of biochemistry under the guidance of Dr. Moon-Soo Kim at Western Kentucky University. Expanding on my previous education in chemistry, I worked to help develop a simple and rapid method for the detection of specific pathogens. Throughout this experience, I was able to gain many valuable experiences that helped me grow both professionally and academically in ways that I could not have imagined prior to being a student at The Gatton Academy.

I ultimately concluded that chemistry wasn't what I was most interested in, but I am forever grateful to both The Gatton Academy and its supporters as I feel more confident about what I want to do than ever before. I would like to extend my heartfelt gratitude to supporters of The Gatton Academy and its faculty as it has allowed students such as myself to capitalize on opportunities and gain many valuable experiences that I likely would not have elsewhere.

Sincerely,

Juwon Joung





JUWON JOUNG

HOMETOWN

Wilmore

HOME COUNTY

Jessamine

HOME HIGH SCHOOL

West Jessamine High School

RESEARCH AREA

Chemistry

RESEARCH TITLE

Integration of Zinc Finger
Protein Arrays onto a
Microfluidic Device for the
Detection of Specific Pathogens

CAREER GOAL

Professor

EXTRACURRICULAR ACTIVITIES

Viola Performance,
Soccer Club, Volleyball Club,
Western Kentucky University
Asian American Association,
Western Kentucky Orchestra

"I'm most looking forward to being able to conduct research full-time. It can be a challenge at times, balancing research on top of everything else going on during the school year. I think being able to focus just on research will likely make for a more enjoyable and memorable research experience."

"As a young person interested in STEM, research is a way I can apply the knowledge that I've gained from my studies. It allows me to directly contribute to advancements made in STEM and helps give me an idea of what pursuing an academic profession would be like."

"The most memorable moment when I realized STEM was my passion happened while I was looking through some published journals to get a better idea of the project that I would be working on. After moments of struggling to understand the large blocks of text, the pieces came together, and I was amazed by how awesome chemistry research really is."

A portrait of a young man with dark, wavy hair and glasses, wearing a blue patterned shirt. He is looking directly at the camera with a slight smile. The background is a blurred green landscape with foliage. A green curved banner is at the bottom of the image, containing his name and location. A green circle with the number 54 is in the bottom left corner.

Varshith Kotagiri

*Frankfort, Kentucky
(Franklin County)*



Dear Gatton Supporter,

As a teenager from Frankfort, my opportunities were limited. Although my school, Western Hills High School, provided many opportunities, I started running out of classes to take and never really fit in with my peers. By the end of my sophomore year of high school, I had taken all the AP mathematics and most of the AP science classes my school offered. I needed a challenge, and I couldn't get one by staying in Frankfort.

That's why The Gatton Academy appealed to me when I first heard about it in sixth grade. It was a place where I could grow and engage with other extremely bright students. Although this was reason enough to attend, one of my main hopes in going to school here was to engage in undergraduate research. I was drawn to the possibility of contributing to the academic world and I felt that research was a way that I could make my mark. Thanks to your generous gift, my dreams have come true. I have not only been challenged in the classroom by taking graduate-level biology courses, but I've been able to explore my passion for cardiology through the internship you helped fund.

Through the Research Internship Grant, I have learned about hypertrophic cardiomyopathy and its effect on the skeletal system with Dr. Ivan Luptak at Boston University's School of Medicine. At Gatton, I've been given opportunities – like the Barry Goldwater Scholarship and USA Biology Olympiad – which would not have been available to me back home. For these things, I am extremely grateful.

Gatton itself has presented its challenges, but the fantastic support Gatton has shown toward me and my peers is truly appreciated. I really cannot say how much Gatton has helped me, and I will be eternally grateful for that.

Sincerely,

Varshith Kotagiri

"I have always thought STEM was my passion. It is hard for me to think of a time when a STEM subject was not my favorite. The experience where I felt like I fell love in with STEM was when I created a volcano in the 5th-grade science fair (I know it is corny). I still remember how excited I was to show the judges. Since then, I have always been excited to do various science projects."

"After Gatton, I intend to become a cardiologist. This internship will give me the experience to learn a lot about the heart and allow me to present my research. The skills and experience I gain from this experience will be invaluable in my quest to figure out if medicine is right for me."

"My favorite memory at The Gatton Academy was synthesizing the compound that my lab has been working on for the past year. I was so excited when we checked the NMR for the compound and figured out that the reaction worked. It was a moment of joy as we saw all of our hard work turn into something amazing."

VARSHITH KOTAGIRI

HOMETOWN

Frankfort

HOME COUNTY

Franklin

HOME HIGH SCHOOL

Western Hills High School

RESEARCH AREA

Biomedical

RESEARCH TITLE

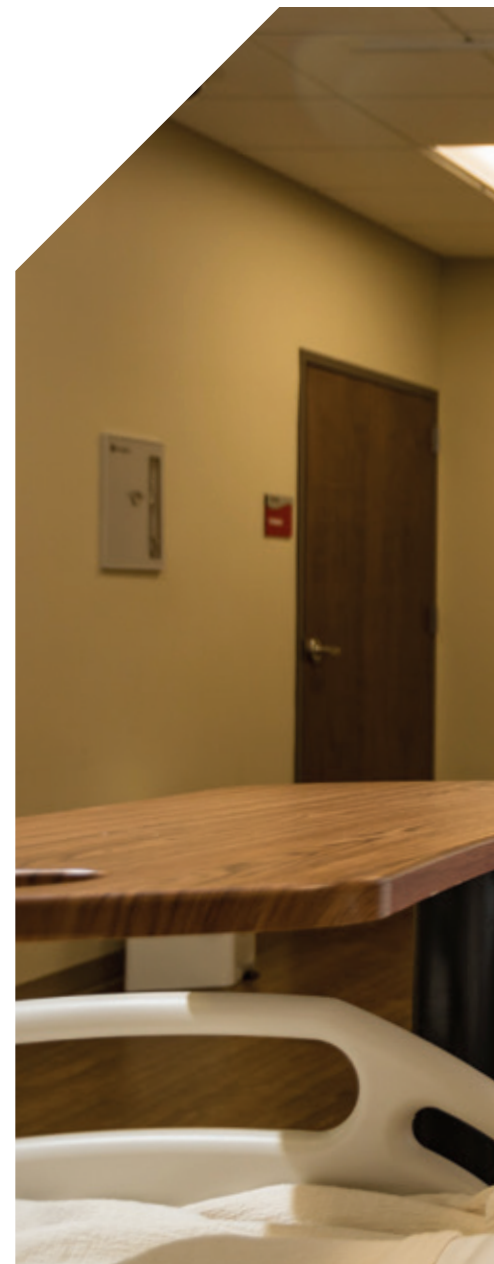
The role of impaired myocardial energetics in the development of hypertrophic cardiomyopathy

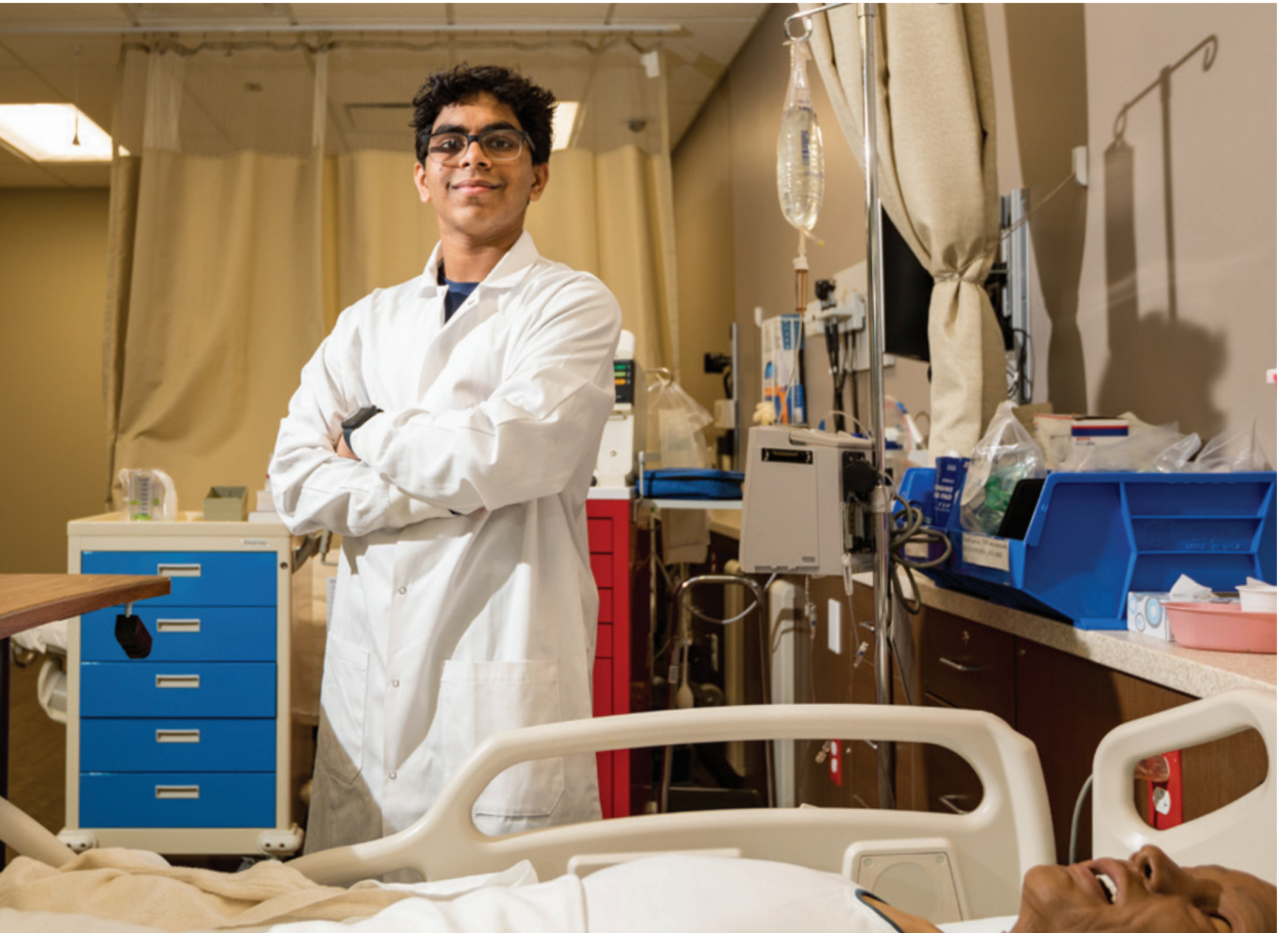
CAREER GOAL

Cardiothoracic Surgeon

EXTRACURRICULAR ACTIVITIES

Math Club, Biology Club,
Chemistry Club, Gatton Academy
Medical Association, Science Bowl,
Society for Industrial and Applied
Mathematics, Soccer Club





A portrait of a young woman with long, wavy blonde hair, smiling at the camera. She is wearing a dark, possibly black, sleeveless top with a draped neckline. She has large hoop earrings and a delicate necklace. The background is a soft-focus green, suggesting foliage. A green curved banner is at the bottom of the image, containing her name and location. A green circle with the number 58 is in the bottom left corner.

Lola Norman

*Alvaton, Kentucky
(Warren County)*



Dear Gatton Supporter,

Reflecting on my journey over the past year at Gatton, I am profoundly grateful for the countless and transformative opportunities that have shaped my path. I am deeply indebted to you for the significant role you played in making my dreams of conducting biological research a reality, and I know I would not have reached this point without your influence.

Throughout my time at Gatton, I have encountered a crucible of support, challenge, and self-discovery. This transformative journey has deepened my appreciation for the dual nature of success and failure as fundamental aspects of the human experience. My initial leap of faith in choosing to join Gatton set me on a path where growth demanded a profound trust in the unseen and the unknown. This trust has been richly rewarded, as it led me to an extraordinary STEM program where I was granted the invaluable opportunity to conduct research focused on mitigating the antibiotic resistance crisis by testing the effect of *Myxococcus xanthus* on the production of secondary metabolites in the presence of different prey.

Throughout my research this summer at Vanderbilt University, my understanding of the biological sciences has been tested, my critical thinking skills challenged, and my problem-solving abilities refined. Furthermore, I aim to utilize the data acquired during this research to effectively communicate my results in research conferences, thereby raising awareness of the antibiotic crisis and the utility of *Myxococcus xanthus* metabolites in the creation of novel antibiotics. Thank you for helping to make all of this possible for me.

Sincerely,

Lola Norman

"I am most excited about jumping right into my research on the antibiotic resistance crisis this summer, aiming to contribute to global efforts in combating this pressing issue. Analyzing my findings for potential novel discoveries adds an extra layer of anticipation to my experience. Equally exciting is the opportunity to build a strong relationship with my mentor, whose guidance and expertise will undoubtedly enrich my research journey."

"The biggest challenge in my research will likely be overcoming obstacles and setbacks that arise along the way. Despite planning and preparation, experiments may not always yield the expected results, and unexpected complications may arise causing moments of frustration or self-doubt. However, it's crucial to remember that setbacks are a natural part of the research process and can often lead to valuable insights and discoveries."

"In my first year at The Gatton Academy, the biggest change I've experienced has been the shift to a more rigorous academic environment and the transition to living away from home. Adjusting to the accelerated pace of coursework and the increased level of independence has been both challenging and rewarding. However, through perseverance and support from peers and mentors, I've adapted to these changes and grown significantly as a student and individual."

LOLA NORMAN

HOMETOWN

Alvaton

HOME COUNTY

Warren

HOME HIGH SCHOOL

Greenwood High School

RESEARCH AREA

Biology

RESEARCH TITLE

The effect of prey
on secondary metabolite
production by
Myxococcus Xanthus

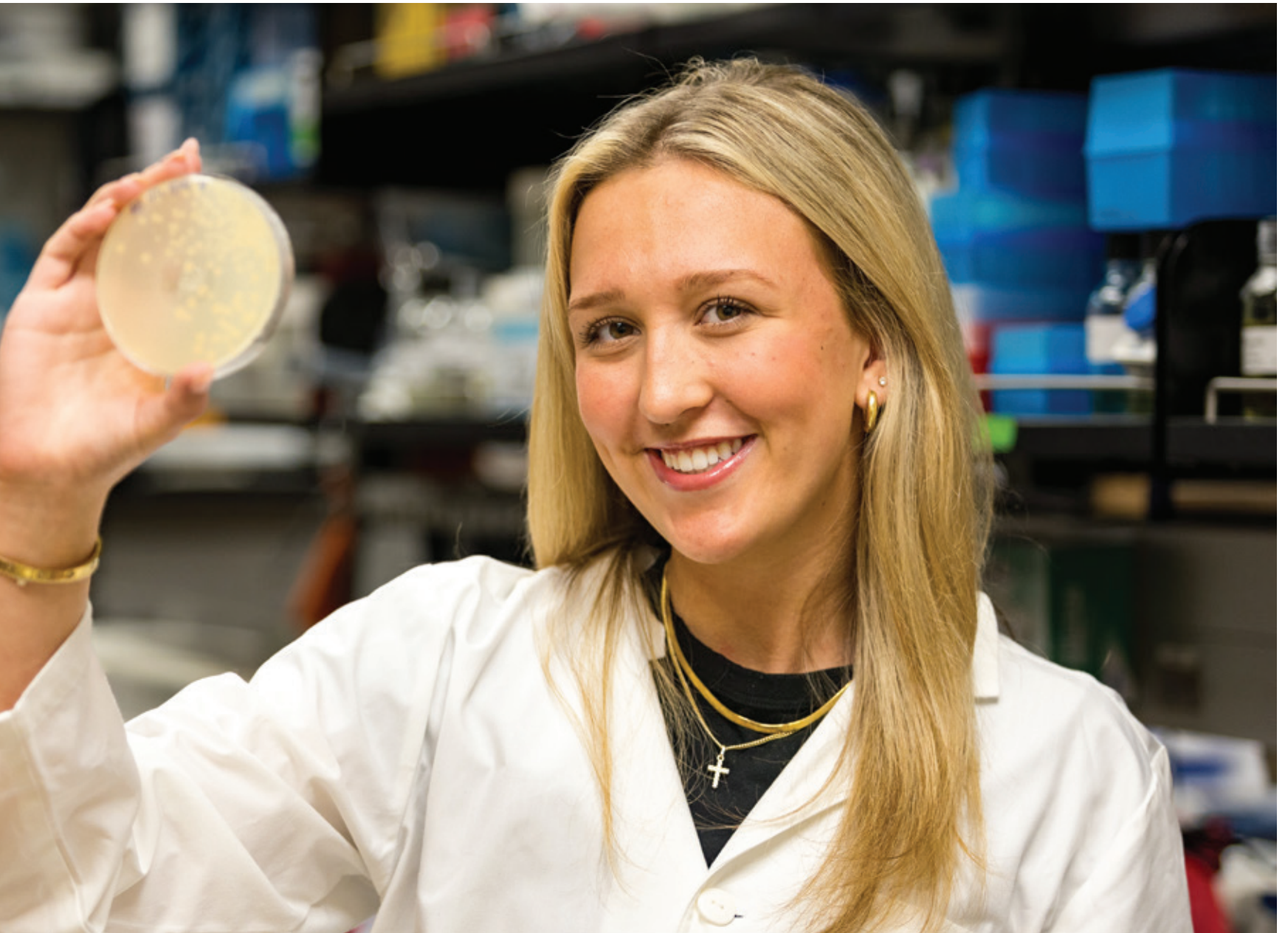
CAREER GOAL

Molecular Pathologist

EXTRACURRICULAR ACTIVITIES

Bible Study, Best Buddies
Peer Buddy, Clarinet Player,
Gatton Academy Leaders in
Education, Kentucky Youth
Assembly, Women in STEM





A portrait of a young man with short, dark, curly hair and glasses, wearing a black hoodie. He is looking slightly to the right. The background is a blurred green field with some yellow flowers. A green curved banner is at the bottom, and a green curved shape is in the top right corner.

Ethan Papp

*Owensboro, Kentucky
(Daviess County)*



Dear Gatton Supporter,

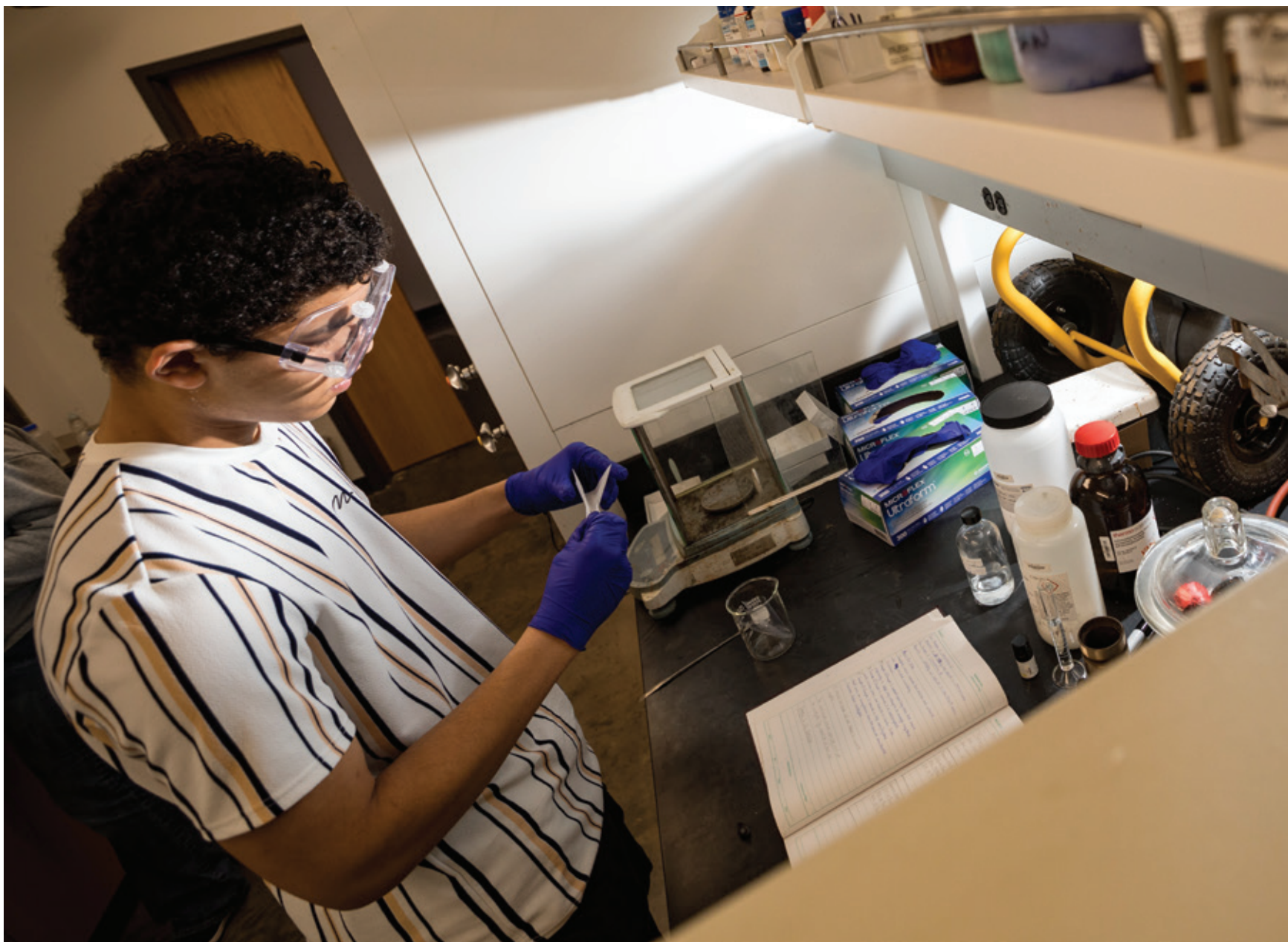
I am writing to express my heartfelt gratitude for supporting my summer research internship. This opportunity has been a transformative step in my academic journey and has deepened my passion for chemistry and sustainable innovation. Over the course of the RIG, I conducted research with Dr. Bangbo Yan focused on the creation of third-row transition metal complexes for the photocatalytic reduction of CO₂. This project provided me with invaluable experience in designing and synthesizing compounds, analyzing their properties, and exploring their potential to contribute to solutions for climate change. It was both challenging and rewarding, and it reinforced my desire to pursue a career in chemical research.

This fall, I presented my research at the American Chemical Society meeting in Atlanta. Sharing my findings with professionals and peers was an incredible experience that not only improved my presentation skills but also deepened my understanding of the broader applications of my work. Engaging with experts helped me explore new ideas for optimizing the design of metal complexes and applying them to real-world challenges in carbon capture and renewable energy. This experience solidified my passion for research and inspired me to continue pursuing innovative solutions to global environmental issues.

These experiences would not have been possible without your support. Your investment in students like me makes a meaningful difference, allowing us to gain hands-on experience and grow as young scientists. I am inspired to continue striving for excellence and to contribute to advancements in chemistry that can benefit society. Thank you once again for your generosity and commitment to fostering opportunities for student researchers. I am deeply grateful for the impact you've had on my academic and personal growth.

Sincerely,

Ethan Papp





ETHAN PAPP

HOMETOWN

Owensboro

HOME COUNTY

Daviess

HOME HIGH SCHOOL

Apollo High School

RESEARCH AREA

Inorganic Chemistry

RESEARCH TITLE

Combining 3rd Row Transition Metals with Existing Inorganic Metal Frameworks to Create Heterocatalysts for the Photocatalytic Reduction of CO₂

CAREER GOAL

Chemistry Professor

EXTRACURRICULAR ACTIVITIES

National Society of Leadership and Success - Community Service Chair for Western Kentucky University's Chapter, DanceBlue, Y-Corps

"My best super-nerd moment was probably when I successfully built my first homemade telescope from scratch. It was both exhilarating and humorous because I ended up accidentally reversing the lenses, resulting in some hilariously distorted images of the night sky. It also happened to be incredibly bad for my eyes."

"The biggest change I've experienced in my first year at The Gatton Academy is the level of academic rigor and independence. Coming from a traditional high school setting, I had to quickly adapt to the fast-paced, college-level coursework and take more responsibility for my own learning. I think that sentiment is shared among many Gatton students."

"As a young person interested in STEM, research means I have the opportunity to explore the unknown, push the boundaries of knowledge, and contribute to real-world solutions. It's about curiosity, innovation, and making a meaningful impact on the world around me."

A portrait of a young woman with long, dark, wavy hair, smiling and looking slightly to the left. She is wearing a white top with a bold purple floral pattern and a gold necklace. The background is a blurred outdoor scene with green foliage and a stone wall. A large green curved shape is in the top right corner, and a white curved shape is in the bottom left corner.

Jill Patel

*Owensboro, Kentucky
(Daviess County)*



Dear Gatton Supporter,

I am extremely honored and grateful for the opportunity to completely immerse myself in a summer full of research! Thanks to the Research Internship Grant (RIG), I spent two months at the Yale Cardiovascular Research Center creating a protein, Functional Upstream Domain (FUD), from bacteria. I analyzed the role of fibronectin on VCAM-1 and KLF 4 on endothelial cells, as well as SM 22 and KLF 4 on vascular smooth muscle cells with and without the presence of a fibronectin fibrillogenesis inhibitor, FUD. Ultimately, we aimed to learn about integrin signaling, mechanotransduction, and disease in the vascular system. I am extremely grateful to be a part of that incredible journey.

On a personal note, I would like to thank you for the opportunity that largely contributes to my career in STEM. I plan to pursue medicine with a specialty in cardiothoracic surgery, and I can see myself using the knowledge and connections I gained through the RIG in my future career. Spending two months at Yale University while working with many researchers in the cardiovascular department allowed me to strengthen my interests and confirm that this is exactly the field I would like to study in the future. I was surrounded by individuals with much wisdom, and they advised me on many topics by sharing their own experiences throughout their career path. I appreciate the time I was able to spend with them, gaining many valuable insights for my future career.

I am extremely grateful to be a part of The Gatton Academy, a place where I can flourish. Again, I cannot thank you enough for the wonderful opportunity you have given me.

Sincerely,

Jill Patel





JILL PATEL

HOMETOWN

Owensboro

HOME COUNTY

Daviess

HOME HIGH SCHOOL

Daviess County High School

RESEARCH AREA

Biochemistry and Molecular Biology

RESEARCH TITLE

Studying the effects of systematic accumulation of the provisional extracellular matrix protein fibronectin in vascular basement membranes as a regulator of vascular endothelial cell alternative splicing

CAREER GOAL

Cardiothoracic Surgeon

EXTRACURRICULAR ACTIVITIES

Health Occupations Students of America,
Gatton Academy Medical Association,
Kentucky Youth Assembly,
Gatton Academy Leaders in Education,
WKU Intramural Volleyball, WKU Tri Beta,
Gatton Biology club, Women in STEM

“I realized my passion for STEM at a young age, sparked by a birthday gift in 5th grade: an anatomy doll. The doll ignited something within me. Throughout my 5th grade year, I was inseparable from my anatomy doll, and that’s when I knew I wanted to pursue a career in surgery.”

“This research internship perfectly aligns with my educational and professional goals! This invaluable research experience provides me with a unique opportunity to delve deeply into the intricacies of the molecular mechanisms underlying cardiovascular diseases, such as atherosclerosis. I plan to pursue a degree in molecular biology and then continue to medical school to become a cardiothoracic surgeon.”

“The biggest change I experienced in my first year at Gatton Academy is my work ethic. Coming from a traditional high school setting, I have had to adjust to develop stronger study habits because of the increased academic rigor.”

A portrait of a young woman with long, wavy reddish-brown hair and freckles, smiling gently. She is wearing a black top. The background is a lush green garden with various plants and a stone wall. A green curved graphic element is in the top right corner, and a white curved graphic element is in the bottom left corner.

Sydney Putnam

*Harrodsburg, Kentucky
(Mercer County)*



Dear Gatton Supporter,

Since fifth grade when my mom told me I could go to college two years early through Gatton, I've had my sights set on attending. From a young age, biology piqued my interest. However, being from Appalachia, I didn't have many opportunities to explore biology. My school didn't offer advanced classes, and the closest research-conducting institutions were at least an hour away. I saw Gatton as a chance to explore what I couldn't at home.

Research was what I was looking forward to most when I started at Gatton. I enrolled in the Genome Discovery and Exploration Program and conducted microbiology research in the classroom throughout my junior year. Through my RIG, I was able to do independent research with Dr. Srivastava for six weeks this summer. Without classes distracting me, I became fully immersed in my research. I crossed flies to downregulate the expression of V-type ATPase, then examined the effects of this on their development. Specifically, I looked at an organ that mimics the process of tumor metastasis, allowing me to make connections between V-type ATPase and the spread of cancer.

Through my RIG, I have explored my interests in molecular biology and discovered my passion for independent research. I found conducting my own experiments and producing results to be very rewarding. I would not have been able to conduct research like this without Gatton and a RIG, made possible by your support. Thank you so much for providing me, along with other Gatton students, an amazing opportunity to grow and learn.

Sincerely,

Sydney Putnam





SYDNEY PUTNAM

HOMETOWN

Harrodsburg

HOME COUNTY

Mercer

HOME HIGH SCHOOL

Mercer County Senior High School

RESEARCH AREA

Biology

RESEARCH TITLE

Effect of V-Type ATPase
Downregulation on Cellular
Architecture of Air Sac
Primordia in *Drosophila*

CAREER GOAL

Neuroradiology? Oncology?
Epidemiology? Gastroenterology?
Anesthesiology? Bioengineering?
Biochemistry? Finance? Law?
I also might just become a farmer.

EXTRACURRICULAR ACTIVITIES

Science Bowl, Y club,
Biology Club, Envirothon

“This research fits into my educational and professional goals by giving me experience researching in the field of biology. I plan on going into biology, so being able to explore my interests will be beneficial.”

*“My favorite Gatton Academy memory was watching *The Hunger Games* in the common area during Finals Week of the first semester. Almost everyone was really stressed, and it was nice to be able to chill and binge movies while we did our work.”*

“As a young person interested in STEM, research gives me the opportunity to be independent and work on something I have an interest in. It is also a way for me to show that, even though I’m still in high school, I’m still capable of performing research at the level of an undergraduate.”

A portrait of Taylor Roberts, a young woman with short brown hair and freckles, smiling. She is wearing a light blue blazer over a black top. The background is a blurred green garden. A green curved graphic element is in the top right corner, and a grey curved graphic element is in the bottom left corner.

Taylor Roberts

*Nicholasville, Kentucky
(Jessamine County)*



Dear Gatton Supporter,

Thank you for supporting Gatton. Going to Gatton has allowed me to go to some amazing places. For instance, I was able to go to Woods Hole, Massachusetts and learn about microbiomes and marine habitats with nine other Gatton students. While there, we toured many labs at one of the top biological research institutions, including the aquarium, where we saw all the model species they ship to labs around the country. They even let us hold horseshoe crabs! We also toured the library, where we saw a first edition copy of the *Origins of Species* signed by Charles Darwin, and we got to hold Thomas Morgan's Nobel prize! It was an amazing experience, and one I never would have gotten if it wasn't for Gatton.

This summer, my research project aimed to examine gene expression patterns of different neuroproteins at different time points. The goal was to add new information about the role of proteins in secondary injury from inflammation. Through this project, I learned several new techniques used in traumatic brain injury research, gained better presentation skills, and contributed to my lab's research mission. Now I am in the process of applying for a neuroscience conference in Boston to present my RIG research! None of this would be possible without you.

I also went to England this summer through the Gatton study abroad program! We got to see amazing places, including Jane Austen's house, which was surprisingly small for the 3-5 women living in it. Going to Gatton has allowed me to go to so many places and experience new things that I might never have seen or done.

Thank you for supporting Gatton!

Sincerely,

Taylor Roberts





TAYLOR ROBERTS

HOMETOWN

Nicholasville

HOME COUNTY

Jessamine

HOME HIGH SCHOOL

East Jessamine High School

RESEARCH AREA

Neuroscience

RESEARCH TITLE

Spatial transcriptomics of
IL-1R1 dependent gene expression
after traumatic brain injury

CAREER GOAL

Neurologist

EXTRACURRICULAR ACTIVITIES

Chemistry Club, Cardistry Club,
Volleyball Club

“Although research is super exciting and I’m eager to meet other students in my lab, I am most looking forward to hanging out with my friends and other Gatton students in Lexington for the summer outside of the Gatton bubble.”

“The biggest change I’ve experienced in my first year since coming to The Gatton Academy is learning to prioritize and speak for myself. Sometimes that means I have to talk to a professor, or it means that if I have a lot of homework to do, I have to say no if my friends want to go out for dinner.”

“Research is an opportunity to actively participate in STEM and to do something that matters. With research, you learn through experience. Maybe you break a few beakers, lose a few slides, and make mistakes, but you’re doing something that helps you grow.”

A portrait of a young woman with long, dark, wavy hair, smiling at the camera. She is wearing a red top with a small white and blue floral pattern and a thin gold necklace with a small heart pendant. The background is a blurred green garden with various plants. A green curved banner is at the bottom, and a green triangle is in the top right corner.

Maggie Rowton

*Paducah, Kentucky
(McCracken County)*



Dear Gatton Supporter,

Thank you so much for your generous funding that has allowed me to conduct research through The Gatton Academy RIG Program. The endless support and opportunities with which Gatton has provided me have had a significant impact on my career goals, and for this, I am eternally grateful.

This summer, my RIG provided me with a seven-week research experience in the Gamberi Research Lab at Coastal Carolina University in Conway, South Carolina. My research focused on studying the Malpighian tubules and gonads in BicC mutant flies to improve the knowledge of pathways leading to renal cyst pathology. This information can be useful in testing the cyst-reducing activity of molecules to find prototypes in the development of future PKD drugs.

My plans include pursuing a career in medicine, so this experience has allowed me to gain a better understanding of all aspects of the field of medicine. With the knowledge I gained, I can make a well-informed decision as to whether I want to pursue the research side of medicine or the practical side as a physician. Regardless of the direction I choose, the skills and knowledge I acquired during my RIG are invaluable and are certainly building blocks in the foundation for my future endeavors.

Thank you again for all the support you provide to Gatton. Because of your generosity, I have had a truly life-changing experience that I will never forget.

Sincerely,

Maggie Rowton

“The part of the summer experience I am most looking forward to is collaborating with other scientists who share the same interests as me. I will be the youngest person in my lab, so I look forward to learning from my older colleagues and applying the skills and knowledge I gain to my future research.”

“The biggest challenge in my research that I will have to overcome is the unpredictability of working with live animals. Time is valuable when experimenting with live animals, so I will have to learn how to deal with any setbacks and make the most of my outcomes.”

“My favorite memories at Gatton have been spent with my floormates. Coming into Gatton, I was nervous about making new friends, but the girls on my floor have become some of my best friends, and my Gatton experience would not be the same without them.”

MAGGIE ROWTON

HOMETOWN

Paducah

HOME COUNTY

McCracken

HOME HIGH SCHOOL

Paducah Tilghman High School

RESEARCH AREA

Biology

RESEARCH TITLE

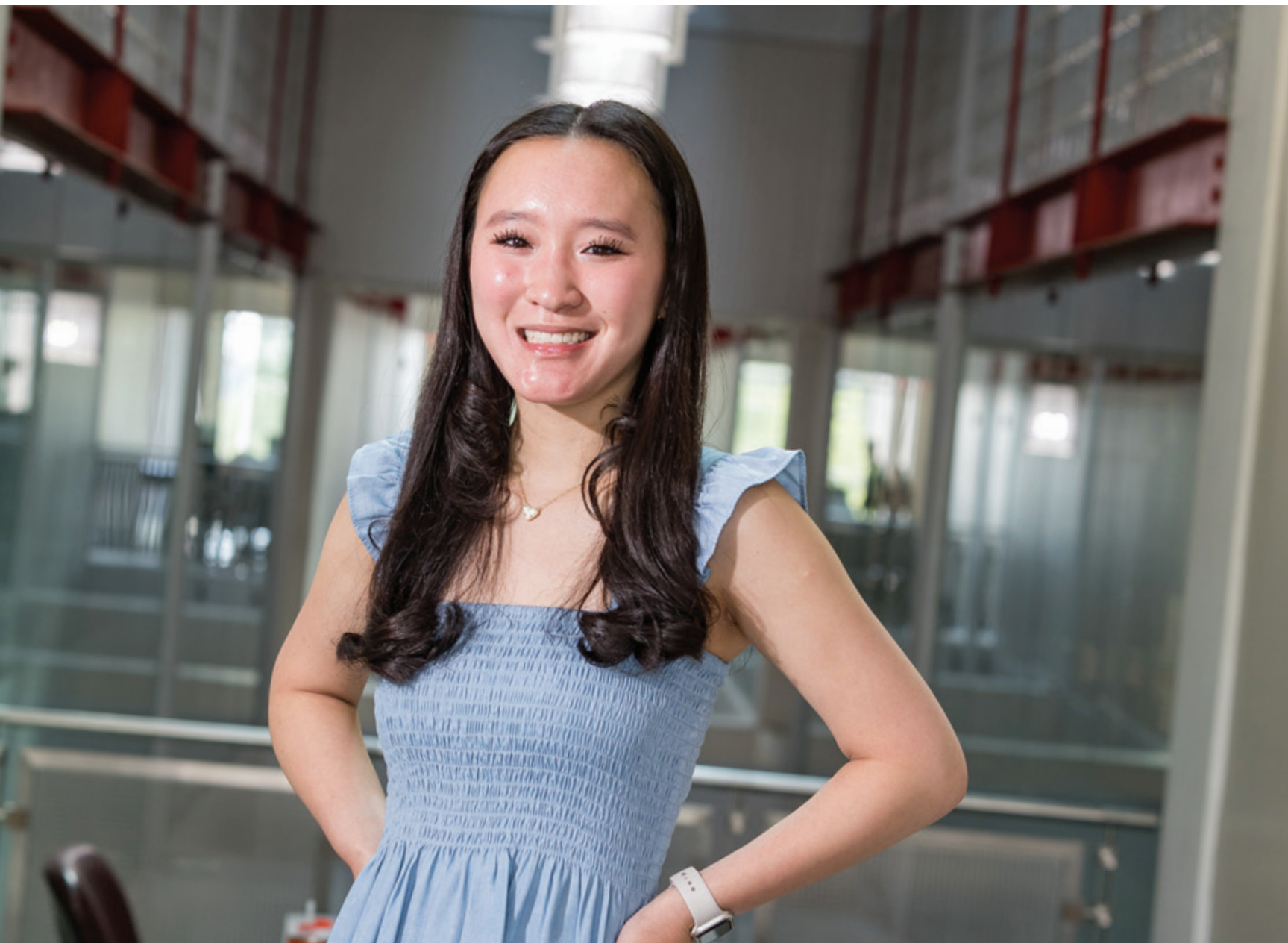
Generating Bicaudal C (BicC) mutant flies to use as models to improve the knowledge of pathways leading to renal cyst pathology and test the cyst-reducing activity of molecules to find prototypes for future PKD drugs

CAREER GOAL

Physician

EXTRACURRICULAR ACTIVITIES

Gatton Academy Medical Association, Bible Study, Volleyball Club, Humane Society Club, Yearbook



A portrait of a young man with dark, wavy hair and black-rimmed glasses, smiling slightly. He is wearing a light-colored plaid button-down shirt. The background is a blurred green outdoor setting. A green curved banner is at the bottom, and a green triangle is in the top right corner.

Rehan Shaikh

*Louisville, Kentucky
(Jefferson County)*



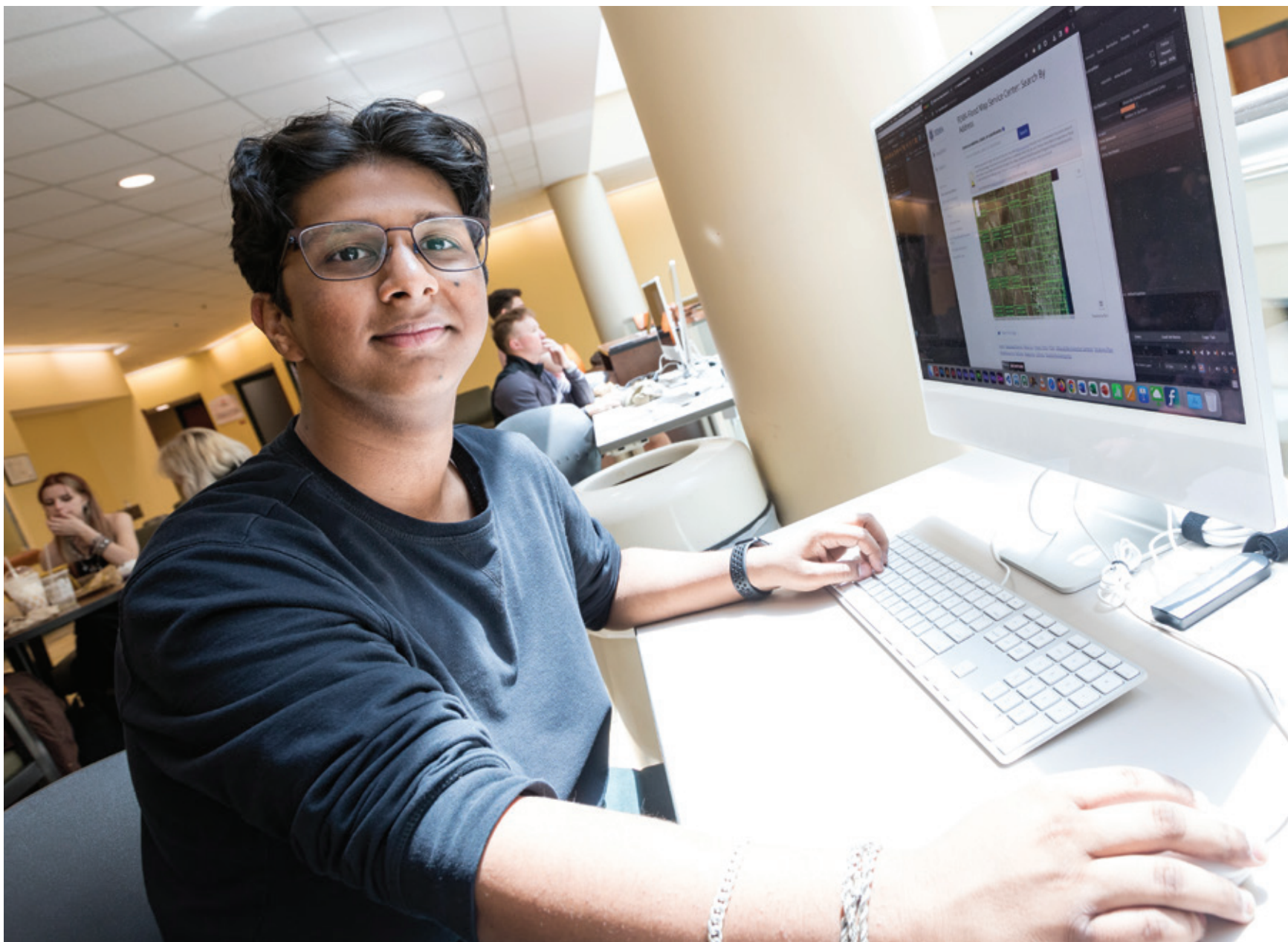
Dear Gatton Supporter,

I cannot thank you enough for your generous contribution to my learning experience. Your support is immensely appreciated, as opportunities like this do not come easily, and opportunity is the reason I stand here today. Opportunity led my family here to America in search of a better life. I was born in India and moved to the States for my father's work. I am forever grateful to him and his efforts to give me the opportunity to get an education here and out of our life in poverty back home. I put you, dear supporter, on that same level of gratitude. Because of your kindness and support, I have the opportunity to conduct research, which is invaluable to my learning experience and my future school career.

I aim to become a mechanical engineer, and Gatton is helping to make my dream a reality. I can take accelerated college courses through Gatton, which have challenged me like my home school couldn't and increased my love for learning. Of course, through Gatton, I have also done student research for the first time, which would have never been possible had I stayed at my home school in Louisville. My summer research is in civil engineering, where I will study and develop resilient architecture to fight against the rising issue of floods in coastal regions. Because of you, I have the chance to do research, but it's more than that; because of you, I have the opportunity to change the world.

I cannot thank you enough,

Rehan Shaikh





REHAN SHAIKH

HOMETOWN

Louisville

HOME COUNTY

Jefferson

HOME HIGH SCHOOL

Ballard High School

RESEARCH AREA

Civil Engineering

RESEARCH TITLE

Developing Resilient
Architecture

CAREER GOAL

Mechanical Engineering

EXTRACURRICULAR ACTIVITIES

Kentucky United Nations
Assembly, Kentucky Youth
Assembly, Humane Society Club,
Swimming Club, Basketball Club

"I'm mostly looking forward to having something to do during the summer. I get so bored every summer just lying around at home doing nothing. This summer I'll be able to do cool research and have goals to achieve throughout the break instead of just living from day to day."

"My research concerns resilient architecture, developing infrastructure, and designing construction to mitigate and reduce flood damage in coastal areas. The biggest challenge I will have to overcome is devising designs that fit all the constraints."

"Many things changed in my first year at Gatton, but some stand out more than others. The most significant change in myself was my new independence. At Gatton, my parents didn't guide me through all that I did, which left me lost for the first few weeks as I got used to the feeling of freedom. I soon realized this newfound freedom needed to be handled with responsibility. Early during the first semester, I needed to learn time management, which was my biggest issue. Eventually I developed self-control and responsibility to manage my time effectively."

A portrait of a young man with long, wavy brown hair, smiling. He is wearing a dark polo shirt. The background is a blurred outdoor scene with green foliage. A green curved banner is at the top right, and a green horizontal banner is at the bottom. A grey curved banner is at the bottom left.

Daniel Thelen

*Corbin, Kentucky
(Whitley County)*



Dear Gatton Supporter,

For me, coming to Gatton was about pushing my boundaries and wading into unknown waters. My Research Internship Grant experience during the summer was yet another step into the unknown that pushed me to grow. My research with Lee Anne Bledsoe in the WKU Crawford Hydrology Lab focused on analyzing flow dynamics in a cave within Mammoth Cave National Park, so we spent our time in caves for a significant portion of my RIG. A few weeks before my internship began, my mentor told me to buy some knee-high boots so my feet would stay dry while we were navigating unpredictable cave conditions. It wasn't until the 6th week of my project that we explored a cave with water that surpassed the height of those boots. As we were hiking through this cave, boots completely waterlogged, my mentor sniffed and commented that the water smelled a little funky. It was at that point that the tour guide informed us that there was a cow pasture directly above the cave.

While that particular experience wasn't one that I would have willingly walked (or waded) into, the rest of my RIG presented infinite possibilities and numerous learning experiences. It gave me an introduction to the world of science, showing me what it looks like to be a scientist and how to write a research paper. Even after my internship was over, the opportunities it granted didn't stop. I was able to experience my first research conference at the Kentucky Junior Academy of Science (KJAS) in Frankfort and was selected to represent KJAS at the American Junior Academy of Science annual meeting in Boston. Coming from a rural area, internships, conferences, and science projects were always a far-off fantasy. I would like to thank you for making those fantasies come true.

Best Regards,

Daniel Thelen

"I realized that STEM was my passion whenever my AP US Government class gave us the task of making a rough sketch of a new invention that we could market. I not only sketched it, but I also learned how to use 3D modeling software and a 3D printer. Using these new skills, I printed my new invention."

"The biggest change I experienced in my first year is coming out of my shell. Before I came to Gatton, I was afraid of meeting new people. However, once I came to Gatton, I overcame my fear and am much more comfortable being around people I do not know."

"As a young person in STEM, research represents the opportunity to launch myself into my career and benefit others along the way. It allows me to express interest in a field of study, and participate in leading projects."

DANIEL THELEN

HOMETOWN

Corbin

HOME COUNTY

Whitley

HOME HIGH SCHOOL

Corbin High School

RESEARCH AREA

Hydrology

RESEARCH TITLE

Great Onyx Groundwater
Basin Study

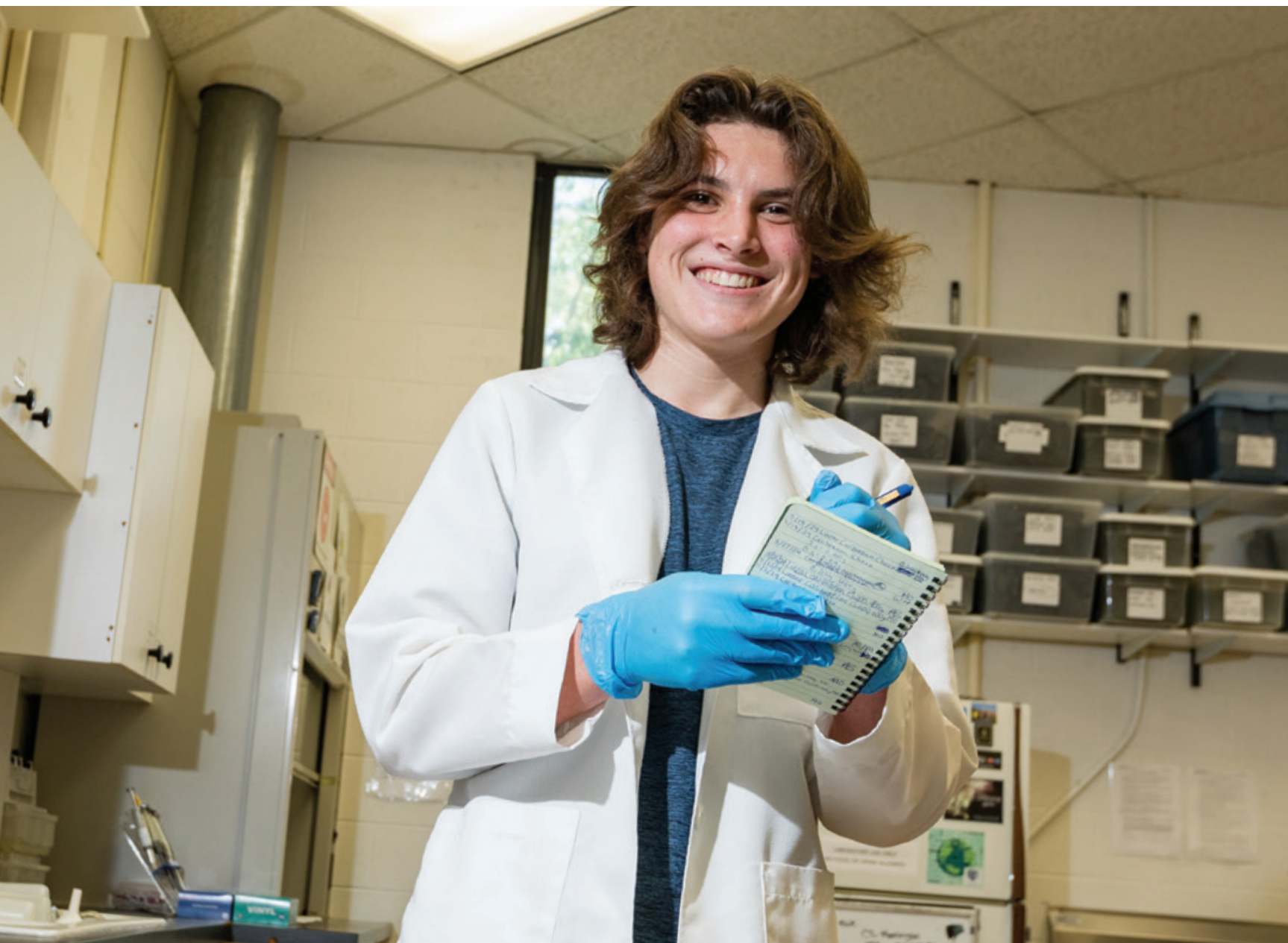
CAREER GOAL

Positively impact the environment

EXTRACURRICULAR ACTIVITIES

Dance Club, Swim Club,
Gatton Academy Leaders in
Education, Humane Society,
Spanish Club, Soccer Club





A portrait of a young woman with long brown hair and light green eyes, smiling slightly. She is wearing a white cardigan over a dark patterned top. The background is a blurred green garden. A green curved banner is at the bottom, and a green triangle is in the top right corner.

Mabel Vilt

*Crestwood, Kentucky
(Oldham County)*



Dear Gatton Supporter,

I have always been deeply fascinated by STEM, and from an early age have taken it upon myself to explore science through any means possible. When I was younger, this often meant going into the creek to look for aquatic life or flipping over rocks in my front yard to look for bugs. My older brother was always beside me in these activities, and after seeing him flourish at Gatton, I wanted to follow in his path.

Coming from Oldham County, I was not prepared for the technological aspects of Gatton. At my old school, we were only expected to know how to open Google Docs on our Chromebooks. Being placed into a computer science course my first semester threw me for a loop and forced me to study more than I previously had, teaching me more than just the course content. Luckily for me, I don't plan to go into a computer science-based occupation. My dream is to be a pediatric ophthalmologist. I have always had an interest in medicine, inspired by my mom who is in the medical field. It is my goal to help as many people as possible, and I think my research this summer will aid me in doing just that.

This summer, I performed dissections on a type of catfish commonly known as *Plecostomus*. We did this in order to get a better sense of the morphology of their ears. This was a cool opportunity and will continue to aid me in the future. I plan to stay in this lab for my time at Gatton and maybe even after I graduate. Without the opportunity to conduct this research over the summer, I'm not sure this is a conclusion I would have come to. Thank you for your support and the opportunity it has given me.

With deepest gratitude,

Mabel Vilt

“I am most looking forward to developing my research and hopefully getting some results that I can use in the future. I am also looking forward to getting more familiar with my lab so that the things I learn over this summer can carry over to my research in the fall.”

“The biggest challenge in my research will be getting images of certain ear structures. Having just started out on dissections, my experience in identifying and removing structures is still limited. This is a skill which I will hopefully build over the summer, so that I will be able to reach some more challenging appendages.”

“I’ve had a lot of wonderful experiences since coming here, and it’s hard to choose just one as my favorite. One which sticks out to me, however, was walking to Meijer with a couple of friends from my first semester, and then sitting in the parking lot and eating sushi. Since then, walking to Meijer has become a sort of “pilgrimage” between my friends and me, and we create new memories every time we make the trek.”

MABEL VILT

HOMETOWN

Crestwood

HOME COUNTY

Oldham

HOME HIGH SCHOOL

Oldham County
High School

RESEARCH AREA

Biology

RESEARCH TITLE

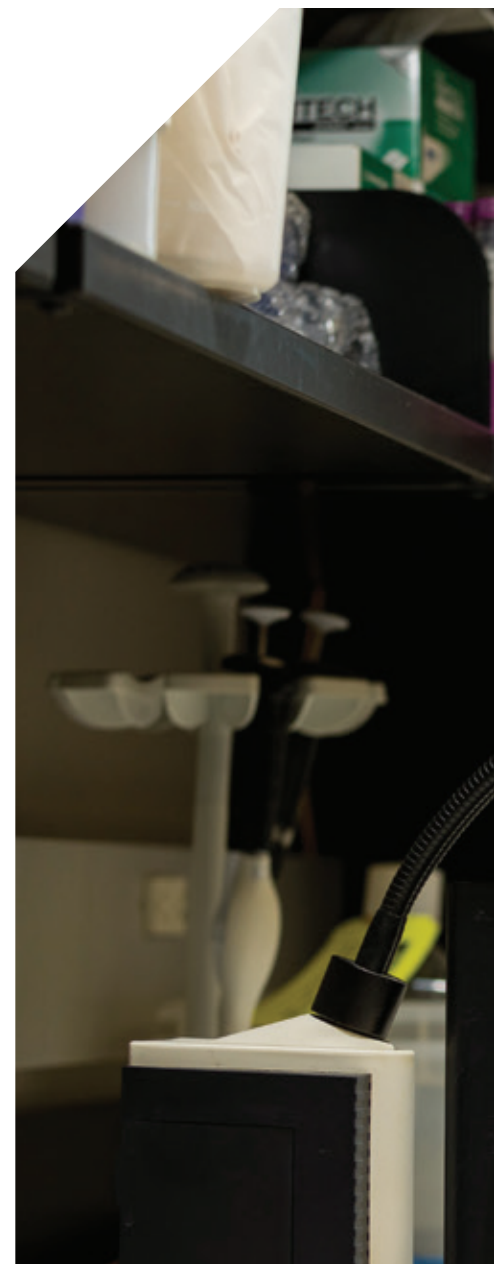
Ear Morphology of
the Plecostomus

CAREER GOAL

Ophthalmologist

EXTRACURRICULAR ACTIVITIES

Science Minded Kids,
Russian Club





A portrait of a young man with brown hair tied back, wearing black-rimmed glasses and a black crewneck sweater. He is looking directly at the camera with a neutral expression. The background is a blurred outdoor scene with green foliage and a stone wall. A large green curved shape is in the top right corner, and a white curved shape is in the bottom left corner.

Eldon Williams

*Leitchfield, Kentucky
(Grayson County)*



Dear Gatton Supporter,

I come from Grayson County, Kentucky: a rural community where opportunities in STEM, especially computer science, are rare. From a young age, technology held my interest. I taught myself basic programming and explored online resources because this was the only content I had access to. However, through secondary schooling, I found no challenge in the coursework I was given. I was not in an environment that pushed me academically. Thankfully, on October 16th, 2022, my life changed when my school counselor forwarded me an email from The Gatton Academy. This was my first exposure to the program and included all I needed to know that it was the right move for me.

During my time at Gatton, I have been challenged in ways I never anticipated. Transitioning away from home to a fast-paced lifestyle at Gatton was demanding, but I have grown into a more resilient and independent person for it. Collaborative projects and friendly debates have allowed me to grow as a student and thinker. This summer, I am thrilled to continue this growth through a research opportunity focusing on the automated grading of entity relationship diagrams for database management courses. This experience propels me toward my goal of pursuing a computer science degree and making meaningful contributions to the field.

Thank you for supporting Gatton and providing students like me with the opportunity to thrive. Your support shapes the future, and I am deeply grateful for the role you play in that journey.

Sincerely,

Eldon Williams





ELDON WILLIAMS

HOMETOWN

Leitchfield

HOME COUNTY

Grayson

HOME HIGH SCHOOL

Grayson County High School

RESEARCH AREA

Computer Science

RESEARCH TITLE

Automated Entity
Relationship Assignment
Grading Using Graph
Theory Techniques

CAREER GOAL

Full Stack Software Engineer

EXTRACURRICULAR ACTIVITIES

C++ Club, Quiz Bowl,
Science Bowl

“My research project is well-suited for my future educational and professional goals as they are all targeted for computer science. This project heavily relies on theoretical and applied computer science, something I will be doing a lot of in the future.”

“The biggest change during my first year at the Academy has been not being bored. I was bored during every class at my sending school. Now I take classes that challenge me in ways I want to be challenged.”

“As a young person in STEM, research means piecing together novel information from the work done by previous researchers. Research is a forever evolving thing, which allows the collective knowledge of humanity to grow.”

*Thank You,
Gatton RIG Supporters!*



