

2020

West Virginia University
OFFICE OF UNDERGRADUATE RESEARCH
ANNUAL REPORT



2020 OFFICE OF UNDERGRADUATE RESEARCH ADMINISTRATION

Dr. Michelle Richards-Babb	Director, Office of Undergraduate Research & Professor, Chemistry
Dr. Cinthia Pacheco	Assistant Director, Office of Undergraduate Research & Director, Research Apprenticeship Program
Kevin J. Walden	Program Coordinator, Office of Undergraduate Research
Paige Zalman	Program Coordinator, Research Apprenticeship Program
Jacqueline L. Loud*	Administrative Assistant, Office of Undergraduate Research
Stephanie Augustine	Graduate Teaching Assistant, Research Apprenticeship Program
Cari Ferguson	Graduate Teaching Assistant, Research Apprenticeship Program
Morgan Simpson	Graduate Teaching Assistant, Research Apprenticeship Program
Parker Carte	Undergraduate Teaching Assistant, Research Apprenticeship Program
Raven Forshee	Undergraduate Teaching Assistant (in training), Research Apprenticeship Program
Kayla Tokar	Undergraduate Teaching Assistant, Research Apprenticeship Program
Kaley Vestal	Undergraduate Teaching Assistant, Research Apprenticeship Program

*Jacqueline Loud supported UGR programming as a Mountaineer Temp from October 2019 to August 2020. We thank her for her timely contributions to UGR's administration as we experienced a staff shortfall during our search for UGR's Assistant Director.

2020 OFFICE OF UNDERGRADUATE RESEARCH ADVISORY COUNCIL

Dr. Candice Brown	Assistant Professor, Neuroscience & Emergency Medicine
Dr. Nancy Caronia	Teaching Assistant Professor, English
Dr. Damien Clement	Associate Professor, Sport & Exercise Psychology
Dr. Radhica Ganapathy	Assistant Professor, Theatre History & Criticism
Dr. Kimberly Meigh	Assistant Professor, Communication Sciences & Disorders
Dr. Melissa Olfert	Associate Professor, Human Nutrition & Foods
Dr. Geah Pressgrove	Assistant Professor, Media
Dr. Dimitra Pyrialakou	Assistant Professor, Civil & Environmental Engineering
Dr. Aaron Robart	Assistant Professor, Biochemistry
Dr. Christopher Rota	Assistant Professor, Wildlife & Fisheries
Dr. Ed Sabolsky	Professor, Mechanical & Aerospace Engineering
Dr. Christopher Scheitle	Associate Professor, Sociology

2020 WVU UNDERGRADUATE RESEARCH PROGRAMS

- **Chemistry Research Experiences for Undergraduates (REU)**, WVU C. Eugene Bennett Department of Chemistry (Directors: Brian Popp & Michelle Richards-Babb; Funding: NSF)
- **Research Apprenticeship Program (RAP)**, WVU Office of Undergraduate Research & Honors College (Directors: Cinthia Pacheco & Paige Zalman; Funding: WVU & FWS)
- **Undergraduate Robotics Research in Human-Swarm Interaction (REU)**, WVU Mechanical and Aerospace Engineering (Directors: Yu Gu & Jason Gross; Funding: NSF)
- **Summer Undergraduate Cancer Research Fellowship Program**, WVU Cancer Institute (WVUCI) (Director: Alexey Ivanov; Funding: Fellowship & Research Endowment Funds)
- **Summer Undergraduate Research Experience (SURE)**, WVU Office of Undergraduate Research (Directors: Michelle Richards-Babb & Rita Rio; Funding: WVU & WV HEPC)
- **NASA West Virginia Space Grant Consortium (WVSGC) Undergraduate Research Fellowship Program** (Program Coordinator: Candy Cordwell)
- **KY-WV Louis Stokes Alliance for Minority Participation (LSAMP)** (Director: David Miller; Funding: NSF)
- **Immunology and Medical Microbiology Research Internships** (Director: John Barnett; Funding: Dept. of Microbiology, Immunology, and Cell Biology)
- **Summer Undergraduate Vision Research Fellowship Program**, Department of Ophthalmology and Visual Sciences, WVU School of Medicine (Director: Jianhai Du; Funding: WV Eye Institute)
- **WV IDeA Network of Biomedical Research Excellence (WV-INBRE) Summer Research Internship** (Coordinator: Valerie Watson; Funding: NIH Institutional Development Award)
- **Beckman Scholars Program**, WVU Office of Undergraduate Research (Director: Michelle Richards-Babb; Funding: Arnold and Mabel Beckman Foundation)

*These programs are administered and funded by the internal and/or external units listed. This list may not be exhaustive of undergraduate research programs at WVU.

†Due to the COVID-19 pandemic, programming offered in Summer 2020 was limited to SURE and the Beckman Scholars Program. RAP is ongoing during Fall 2020 despite the continuing pandemic.

2020 HIGHLIGHTS, BY THE NUMBERS

- 1** Student represented WVU at the first-ever “Virtual” 2020 Posters on the Hill
- 4** Faculty awardees for Distinction in Mentoring Undergraduates in Research
- 6** Presentations by UGR staff at “Virtual” events, namely, (i) Biennial Conference on Undergraduate Research and (ii) WV Science Teacher’s Assoc.
- 7** WVU students accepted to present research at the National Conference on Undergraduate Research (NCUR) - cancelled due to COVID-19
- 13** Rising freshmen who engaged in WVU’s 2-week “Virtual” Summer Research Immersion funded by the NSF INCLUDES statewide First2 Network
- 15** Maximum class size of research course sections associated with the academic year Research Apprenticeship Program (RAP)
- 16** Undergraduate students on the Editorial Review Board for MURR Vol. 5
- 31** Graduate student judges at the 12th annual “Virtual” Summer Undergraduate Research Symposium
- 31** Undergraduates engaged in research via the 2020 “Virtual” SURE program
- 39** WVU students who presented at the 17th annual Undergraduate Research Day at the Capitol (URDC)
- 47** Students presenting at WVU’s 12th annual “Virtual” Summer Undergraduate Research Symposium (34 from WVU and 13 visiting students)
- 62** Peer-reviewed publications co-authored by SURE participants (2017-20)
- 183** Presenters at WVU’s 4th annual and first-ever “Virtual” Undergraduate Spring Symposium (19 oral, 4 visual/performing arts & 160 posters)
- 351** Students engaged in research and creative endeavors via RAP in 2020 despite COVID-19 (189 Spring & 162 Fall)
- 944** Students involved in scholarly activity via research coursework during the 2019-2020 academic year despite the COVID-19 pandemic
- 3668** Minimum number of students involved in research coursework over the last five years

The Office of Undergraduate Research was established in August of 2015. The Office reports to the Dean of the Honors College. WVU is an Institutional Member of the Council on Undergraduate Research (cur.org).

FACULTY AWARDS FOR DISTINCTION IN MENTORING UNDERGRADUATES IN RESEARCH

The purpose of this award is to recognize, reward, and encourage faculty members who mentor undergraduates in research and creative endeavors. A maximum of four awards in the categories of Physical Sciences & Technology, Humanities & the Arts, Behavioral & Social Sciences, and Biosciences & Health Sciences are available. Nominations are accepted from any source in March of each year. Outstanding nominees are invited to submit supporting documentation. Awards are made at WVU's Annual Faculty and Staff Recognition Ceremony. Unfortunately, the COVID-19 pandemic has deferred the recognition ceremony for our 2020 awardees.



Recipients of the 2020 Faculty Award for Distinction in Mentoring Undergraduates in Research, from left to right, Cole Vonder Haar (Psychology), Jessica Hoover (Chemistry), Travis Stimeling (Musicology), and Daniel Panaccione (Plant and Soil Sciences).

Cole Vonder Haar, Assistant Professor of Psychology (Eberly College of Arts and Sciences)

Cole Vonder Haar is a prolific mentor of undergraduates. Since 2016, he has mentored 25 undergraduates in research and, at any given time, is mentoring four or more students in his research space. Most, if not all, have presented their research at local, regional and/or national conferences. Seven of Vonder Haar's undergraduate researchers appear as co-authors on five peer-reviewed publications. Vonder Haar indicates that he mentors undergraduates in research by *"scaffolding students from 'no skills' to carrying out some of the most delicate and advanced procedures."* The Psychology Chair writes that Vonder Haar has *"appreciation for these bright young scientists"* and that *"they are treated as full and valued members of his research team."* The words of one undergraduate researcher say it best: *"Where I once was insecure and unsure about my own research abilities, I am now a confident, creative, and inspired researcher due to Dr. Vonder Haar's commitment not only to his lab, but to me."*

Jessica Hoover, Associate Professor of Chemistry (Eberly College of Arts and Sciences)

Since 2012, Jessica Hoover has mentored at least 26 undergraduates in her research lab. Of these, many have gone on to attend graduate programs in chemistry (e.g., UC Irvine, UNC Chapel Hill, U. of Michigan) or professional programs (WVU MD program, Office of Special Investigations). In addition, Hoover mentored two students to prestigious awards, a Fulbright Scholarship and an NSF Graduate Research Fellowship. One first-generation student credits Hoover for her decision to attend graduate school because the student was *"given the space to form my own opinions about the next steps in our investigation while still having her guidance"*. Another undergraduate researcher noted that Jessica Hoover is the *"best kind of mentor"* and notes that her undergraduate research experience was the *"most beneficial part"* of her undergraduate career. The Chemistry Chair notes that Hoover's *"distinguished contributions as an*

undergraduate research mentor make disproportionate positive contributions to the overall quality and experience of chemistry majors “

Travis Stimeling, Associate Professor of Musicology (College of Creative Arts)

In a field where the convention is to work alone and to publish single-authored texts, Travis Stimeling is bucking the convention. Since 2016, he has included at least five undergraduates in research - four inexperienced students supported in academic year research via the Research Apprenticeship Program and two more experienced students supported in full-time summer research during the Summer Undergraduate Research Experience. Stimeling engages these students in meaningful research-oriented tasks, including compiling bibliographies, gathering archival materials, transcribing interviews, and writing article summaries. His research mentoring includes frequent meetings where the *“real work happens, as we get to talk about the various ways that they can make their own paths in the world”* and where he can *“help them realize their potential as scholars.”* One undergraduate researcher writes that Stimeling has *“given me the privilege of co-authoring a peer-reviewed publication”* and that this *“is very rare in musicology.”* Further, Stimeling engaged this student in curriculum development of music history pedagogy based on the article’s research results. The School of Music Director notes that Stimeling *“embodies core WVU values”* and is known for his *“respect and compassion, in particular, for those who are underprivileged or underrepresented”*.

Daniel Panaccione, Professor of Plant and Soil Sciences (Davis College of Agriculture, Natural Resources and Design)

Daniel Panaccione has mentored 24 undergraduate students in research and is currently supporting three undergraduates in research via an NIH R15 grant award. He is host to one of two students supported in 15-months of research by the 2020 Beckman Scholars Program, WVU’s most selective undergraduate research program. Panaccione treats his undergraduate researchers as *“intelligent, independent researchers capable of excellent work.”* His undergraduate researchers have presented a total of eight posters and two invited oral presentations at national and regional disciplinary conferences with at least five undergraduate co-authors in the last five years. On two separate occasions, Panaccione’s undergraduate researchers were selected to represent the state of West Virginia at the competitive and nationwide CUR Posters on the Hill in Washington, D.C. One undergraduate researcher, whom Panaccione mentored to an NSF Graduate Research Fellowship, noted that Panaccione *“taught me the scientific method, treated me as a colleague, and provided mentoring with humility.”* The Plant and Soil Sciences Chair notes that Panaccione *“has embraced undergraduate research”* even though he could *“focus his efforts on graduate education.”*

UNDERGRADUATE RESEARCH ASSOCIATION – UGR’S STUDENT ARM

The Office of Undergraduate Research has partnered with student researchers to revive the Undergraduate Research Association (URA), a WVU student club and the “student arm” of UGR. It works with undergraduate researchers and those seeking these positions to support and expand undergraduate scholarly activity (research and creative endeavors) at WVU. URA was founded in the fall of 2016 and was active until spring of 2018. In spring of 2019, Devin Kelly began the revival of URA as its new President and aided by five dedicated members. During 2019 and 2020, URA (i) aided UGR in offering programming like the “Introduction to Undergraduate Research Networking Event,” where freshmen and sophomore students are informed of the benefits of engaging in scholarly activities by peers, and (ii) offered regular themed meetings (e.g., finding mentors, pivoting research in virtual environment) and workshop series (see 2020 topics and attendance below). In fact, URA membership has increased dramatically from its initial six members (May 2019) to its current membership of 54 (November 2020).

Date	Number of URA Members
May 2019	6
Dec. 2019	18
May 2020	22
Nov. 2020	54

“Virtual” Workshop (Presenter)	Date	Undergraduate Attendance (Approximate)
Intro to External Research Opportunities (Dr. Michelle Richards-Babb)	Oct. 15, 2020	10
How to Efficiently Read Research Papers (Dr. Fabien Goulay)	Oct. 22, 2020	50

URA officers for 2020-2021 include President Devin Kelly (Biochemistry – Hedgesville, WV), Vice President Jessica Hogbin (History, World Languages and Italian Studies – Hedgesville, WV), Secretary William Pentz (Mathematics and Biochemistry – Morgantown, WV), Treasurer Nathaniel Paine (Business Administration – Morgantown, WV), and Recruitment Chair Kathryn Wolfe (Biology – Morgantown, WV).

- written by Devin Kelly, 2019-2020 URA President

UGR’s Kevin Walden – Inaugural Shining STAR Recipient

In December 2020, we were informed that UGR’s Kevin Walden was selected as one of WVU’s six inaugural [Shining STARS](#) from a pool of over 75 nominations. Shining STARS represent WVU in a “positive light.” They go “above and beyond to make a positive impact, provide extraordinary support and service and are focused on maintaining a positive faculty, staff and/or student experience.” Not only was Kevin nominated for a Shining STAR by UGR staff, he was also nominated by the students he mentors. We are extremely proud of Kevin and all that he has accomplished since joining UGR in 2017. We are also indebted to WVU’s Talent and Culture who go out of their way to recognize the value of stellar employees like Kevin. Kevin’s nominations speak volumes to his positive impacts on staff and students associated with UGR.



Kevin Walden on his very first day of work for WVU’s Office of Undergraduate Research.

UNDERGRADUATE RESEARCH DAY AT THE CAPITOL

Annually, WVU undergraduates showcase their research and creative works to West Virginia lawmakers and the general public at the statewide Undergraduate Research Day at the Capitol (URDC) event. This event gives lawmakers a glimpse of the value of continuing to fund West Virginia academic institutions in both educational and research endeavors.

A total of 68 WVU students submitted abstracts to the 17th annual URDC event. Of those, 40 students were invited and presented their research projects to lawmakers in poster form at the Capitol Rotunda in Charleston, WV on February 7, 2020. The projects were original scholarly works and the presenters designed posters for a general audience showcasing research in fields ranging from human engagement disciplines of dental hygiene, history, and social work to STEM disciplines of astronomy, biomedical engineering, and environmental studies. Representatives from the Senate and House of Delegates of the West Virginia State Legislature visited presenters from their districts to learn about research at the undergraduate level and how congressional action—policy and budget allocations—support research and creative endeavors. WVU's Evan Widders, Associate Provost for Undergraduate Education, spoke during the URDC luncheon touching upon the benefits to institutions that offer undergraduate research opportunities.

Due to the COVID-19 pandemic, the 18th annual URDC Event will be held virtually with presentations available beginning on Friday March 5, 2021.



Photos from the 2020 Undergraduate Research Day at the Capitol (URDC) Event. Top left: Graduate Teaching Assistants for the Research Apprenticeship Program, Cari Ferguson and Madison Brooks, help students check-in at URDC. Top right: Two NSF LSAMP funded researchers, Kingsly Jonathan and Madewa Adeniyi, presented their SURE research at URDC. Bottom: The WVU contingent, consisting of undergraduate presenters, faculty, staff, and administrators, after the 2020 URDC luncheon.

“VIRTUAL” UNDERGRADUATE SPRING SYMPOSIUM

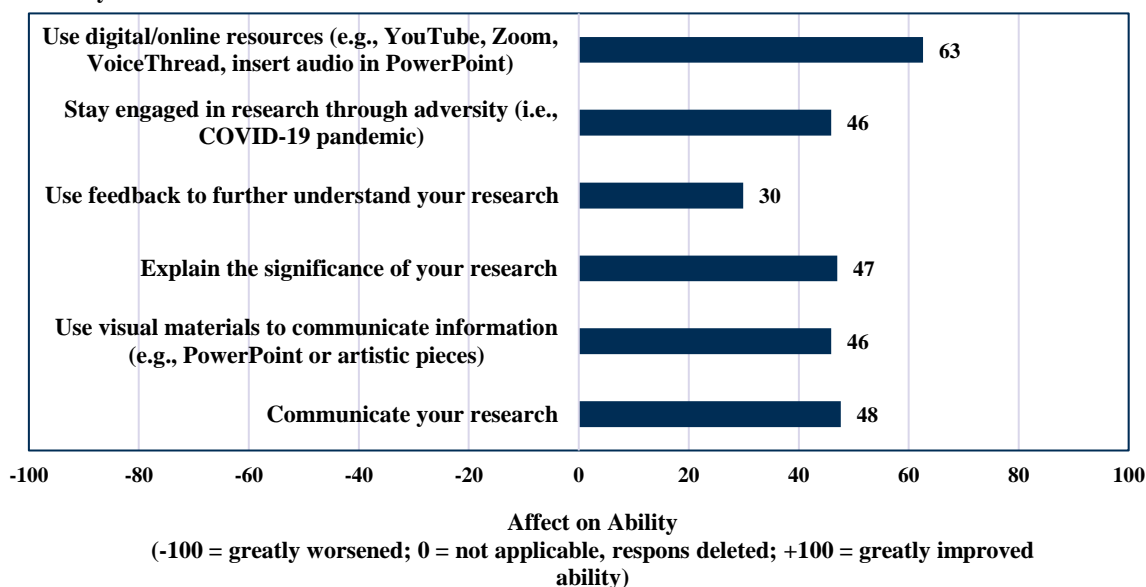
The 4TH annual Undergraduate Spring Symposium was set to take place in-person on April 3, 2020. However, because of the COVID-19 pandemic, WVU made the decision to send students home for spring break on Tuesday, March 10, 2020. Subsequently, students stayed home and finished their spring coursework virtually. The Office of Undergraduate Research (UGR) had a decision to make. Cancel the spring symposium or offer it virtually? By Thursday, March 12, UGR had decided not to cancel, but to fashion a virtual and interactive Undergraduate Spring Symposium. From that time forward and until April 16, 2020, UGR staff worked diligently from home on laptop computers to deliver WVU’s first-ever “Virtual Undergraduate Spring Symposium.”

What did this entail? A huge learning curve and the combined attention of five UGR staff working nearly full-time on the event for the month leading up to the virtual symposium. A symposium specific website was developed and a symposium booklet was fashioned. To keep them abreast of symposium developments, multiple emails were sent to the 202 presenters and their faculty research mentors. Instructions were fashioned to inform students on how to embed audio in video presentations. Various delivery platforms were reviewed and the VoiceThread platform was chosen. Accessibility concerns (e.g., closed captioning, screen readers) were identified and addressed on the website and with student presentations. Individual meetings with students were arranged on Zoom, as needed. Once uploaded to VoiceThread, links to each presenter’s presentation were generated and were linked on the Symposium website.



The Symposium went live on Thursday, April 16, 2020 at noon and remained open and curated through April 30. Eventually, 183 students from wide-ranging disciplines uploaded presentations for WVU’s 4th annual and first-ever “Virtual” Undergraduate Spring Symposium (19 oral, 4 visual/performing arts, & 160 posters). Using pre-recorded audio enabled video, presenters explained the results of their discipline-specific scholarly activity (research/creative projects) to attendees to show them what amazing research our undergraduates are doing. The VoiceThread platform allowed attendees to post comments, suggestions, and

Average response to - How much did preparing for your virtual presentation affect your ability to:



questions within the presentations. Presenters posted responses within the platform over the following week.

As the chart above indicates, presenters ($N=34$) who responded to the “Virtual Symposium Assessment” generally reported good effects on their abilities to prepare their research for presentation and to communicate their research. Though the first-ever virtual symposium was a success, UGR staff identified areas for improvement and this was echoed by presenters who completed the “Virtual Symposium Assessment.” As one presenter wrote:

“However, I do want to stress that with all of the last-minute changes that occurred, the Office of Undergrad Research did a FANTASTIC job adapting to the pandemic and their work is so very appreciated.”

Most presentations from the [2020 “Virtual” Undergraduate Spring Symposium](#) remain viewable and serve as a showcase of undergraduate research opportunities available across disciplines at WVU.

“VIRTUAL” SUMMER UNDERGRADUATE RESEARCH SYMPOSIUM

The Summer Undergraduate Research Symposium has served as the culminating event for summer undergraduate research programs across the WVU campus since 2009. Typically, over 100 students present at the Summer Symposium. Most of WVU’s 2020 summer undergraduate research programs were cancelled because of the COVID-19 pandemic. However, a reduced virtual SURE program was held for 31 students. To boost the number of presenters at the Summer Symposium, undergraduate researchers at institutions throughout West Virginia were invited. Of the 47 undergraduate presenters, 34 attended WVU and 13 were undergraduate researchers at Marshall University (5), West Liberty University (5), and Shepherd University (3).



As with the Spring Symposium, the Summer Symposium went virtual. This symposium provided presenters with a similar experience to that of a disciplinary conference. Presenters prepared audio-enabled professional presentations (oral or poster) that displayed the research process, hypothesis, data, conclusions and real-life applications. Presentations were uploaded to the VoiceThread platform which allowed for open attendance, commenting by attendees, and responses to comments by presenters.

Presentations were divided into seven different judged categories (two oral and three poster, see below) with a total of 31 judges. Judges were advanced graduate students from WVU who served as content experts in the disciplinary area of each category.

Oral presentation categories: Human Engagement* and Science & Technology;

Poster presentation categories: Biological Sciences, Engineering, Health Sciences, Math & Physical Sciences, and Social & Behavioral Sciences



*Human Engagement category includes research and scholarship pertaining to how humans interact and engage within society in the areas of business, education, creative arts, and the humanities.

The WVU community and the presenters' research groups, as well as the general public, including family, were invited to attend. Thirteen (13) rising freshmen students, most matriculating into WVU and participating in the NSF INCLUDES First2 Network's two-week summer immersion program, also attended.

Lessons learned from the Spring Symposium were incorporated to better engage presenters with attendees and to allow all attendees, not just WVU-affiliated attendees, to comment and post questions on presentations. During "Synchronous Commenting," presenters monitored and responded to questions and comments posted within their presentations in real-time. Graduate students judged presentations with each presentation being viewed and commented on by a minimum of two judges. As shown in the table below, both the average number of presentation views and the average number of comments posted on each presentation more than tripled from spring to summer.

Symposium	2020 "Virtual" Undergraduate Spring Symposium (N = 183; as of 5/1/2020)	2020 "Virtual" Summer Undergraduate Research Symposium (N = 47; as of 7/31/2020)
Average number of comments per presentation	5.5	19.7
Average number of views per presentation	4.3	25.6
Total number of views	792	1202

Presenters who responded to the "Virtual Symposium Assessment" identified positive aspects of the Symposium in response to the question, "What were highlights of the organization of the virtual symposium?" A few representative comments are reproduced below.

"Being able to share with people who don't live in Morgantown; the presentation continues to be available past this event."

"I believe the questions were great, as I had fun answering them and it was nice seeing all of the presentations from others."

"I love that it was easily accessible, and the comments made it simple and easy to address questions. I liked the synchronous commenting."

The 12th annual "Virtual" Summer Undergraduate Research Symposium was hosted by the WVU Office of Undergraduate Research on Thursday, July 23, 2020. Most presentations from the [Summer Symposium](#) remain viewable. Seven presenters were selected as winners in their categories.

Category winners and runners-up (bold = undergraduate presenter; underline = faculty mentor) from the 2020 summer symposium were:

Human Engagement Category (4 oral presentations)

Winner: *Storied Research: Alternative Writing Styles for Scientific Research.* **Gwendolyn Nurkiewicz** and Renee Nicholson. (Gwendolyn, an Immunology and Medical Microbiology major at West Virginia University from Morgantown, WV, is a participant in the [Honors EXCEL](#) program.)



Science & Technology Category (8 oral presentations)

Winner: *Functional and Genetic Analysis of an Esterase Gene Involved in Synthesis of Ergot Alkaloids.* **Kelcie N. Britton**, Chey R. Steen, Jessi K. Sampson, and Daniel G. Panaccione. (Kelcie, an Immunology and Medical Microbiology major at WVU from Morgantown, WV, is a 2020 [Beckman Scholar](#).)



Biological Sciences Category (8 poster presentations)

Winner: *Studying the Structure-Function Relationship of the Platelet-Activating Factor Receptor Using Molecular Dynamics Simulations.* **Nicholas Walker** and Blake Mertz. (Nicholas, a Biology major at WVU from Charleston, WV, was a participant in the [WVU SURE program](#).)



Engineering Category (8 poster presentations)

Winner: *Capturing Images of Fingerprints Using Smartphone Cameras.* **Markel Umphrey** and Jeremy Dawson. (Markel, a Biometric Systems Engineering major at WVU from Wilmington, DE, was a participant in the SURE program and was funded via an NSF LSAMP STEM Pathways and Research Alliance Phase III grant.)

Health Sciences Category (5 poster presentations)

Winner: *Aberrant Cortical Networks for Multi-Sensory Processing in Autism Spectrum Disorder.* **Michelle M. Coleman**, Paula J. Webster and James W. Lewis. (Michelle, an Exercise Physiology and Psychology double major at WVU from Symrna, DE, was a participant in the [WVU SURE program](#).)



Math & Physical Sciences Category (7 poster presentations)

Winner: *Equations on the Effects of Anti-CTLA-4 Antibodies on Tumor Growth.* **Heidi Reichert** and Qing Wang. (Heidi, a Mathematics major from Shepherd University, was supported in research by the West Virginia IDeA Network for Biomedical Research Excellence.)



Social & Behavioral Sciences Category (7 poster presentations)

Winner: *Adolescent Girls' Political Efficacy: Changes Across Time*. **Melanie R. Quick** and Aaron Metzger. (Melanie, a Psychology major at WVU from Flemington, NJ, was a participant in the [WVU SURE program](#).)



“VIRTUAL” FALL RESEARCH SYMPOSIUM - RAP

On November 14, 2020, UGR hosted its third fall symposium but in virtual format. Presenters included second-semester RAP participants, students from the Honors EXCEL program, and WVU's Beckman Scholars. Lessons learned from UGR's two previous virtual symposia translated into an exceptional event with attendees from across the state. Instead of VoiceThread, UGR successfully used the YouTube platform for upload of audio enabled video presentations and generation of presentation links. The event opened at 11 am for attendees and judges with interactive components, including a live faculty panel (1-2 pm) and synchronous presenter commenting (2-4:30 pm). The multidisciplinary panel presentation, “How WVU researchers are responding to the ongoing COVID-19 pandemic,” included four panelists from different fields who spoke of their innovative and creative ideas for responding to the ongoing pandemic. Panelists included:

- **Brad Price** (Chambers College of Business and Economics),
- **Ivan Martinez** (Cancer Institute, School of Medicine),
- **Jamie Shinn** (Department of Geology and Geography),
and
- **Kym Scott** (School of Music)

The 2020 Fall Symposium had a total of 57 student presenters and six separate sessions with 43 poster presenters, 13 oral presenters and 1 performance. Graduate students judged presentations with each presentation being viewed and commented on by a minimum of two judges. Attendees included faculty mentors, professors, peers, and first-semester RAP participants (RAP Part I). The event inspires RAP participants and provides a preview of their culminating presentations after completing the second semester of RAP.

This symposium served as a model for WVU's Eberly Research Office and for the 2021 URDC Steering Committee as they work to fashion virtual symposia for graduate students and statewide undergraduates, respectively. UGR is glad to share its experience in organizing virtual symposia to benefit others. Presentations from the [Fall Symposium](#) remain viewable.

Category winners and runners-up (bold = undergraduate presenter; underline = faculty mentor) from the 2020 fall symposium were:



Human Engagement (4 oral presentations)

Winner: *Queer Histories in Morgantown, West Virginia*. **Kelsey Greene** and Ellen Rodrigues. (Kelsey, an English and Sociology major at West Virginia University from Parkersburg, WV, is a participant in the RAP program).

Science & Technology (10 oral presentations)

Winner: *Functional and Genetic Analysis of Esterase Genes Involved in Synthesis of Ergot Alkaloids*. **Kelcie Britton** and Daniel Panaccione. (Kelcie, an Immunology and Medical Microbiology major at West Virginia University from Morgantown, WV is a 2020 Beckman scholar).



Biological Sciences (6 poster presentations)

Winner: *Measures Taken by Oak and Maple Trees to Mitigate Drought in Temperate Forests*. **Christopher Hughes** and Edward Brzostek (Christopher, a Biology major at West Virginia University from Berkeley Springs, WV, is a participant in the Research Apprenticeship Program).



Health Sciences (17 poster presentations)

Winner: *High-Risk Burden Predictors of One Year Mortality Following Transcatheter Aortic Valve Implantation*. **Raafay Uqaily** and Naveena Yanamala. (Raafay is a Biomedical Engineering major at West Virginia University from Morgantown, WV, and is a participant in the Research Apprenticeship Program).



Runner Up: *Analysis of Circulating microRNAs Targeting DNA Methyltransferases as a Predictor for Treatment Outcome*. **Autumn Rogers**, Timothy Eubank, and Duaa Dakhallallah. (Autumn, an Immunology and Medical Microbiology major at West Virginia University from Shady Spring, WV, is a participant in the Research Apprenticeship Program).



Behavioral & Social Sciences (8 poster presentations)

Winner: *Childhood Frequency of Church Attendance Effects on Adulthood Scrupulosity Scores*. **Sabrina Siegan** and Shari Steinman. (Sabrina, an Immunology and Medical Microbiology major at West Virginia University from Troy, MI, is a participant in the Research Apprenticeship Program).



Physical Sciences & Engineering (10 poster presentations)

Winner: *Differences in Stepping Characteristics During the TUG Test with Aging and Neurodegenerative Disease.* **Melina McCabe** and Jessica Allen. (Melina, a Biomedical Engineering major at West Virginia University from Wheeling, WV, is a participant in the Research Apprenticeship Program).



NATIONAL CONFERENCE ON UNDERGRADUATE RESEARCH (NCUR)

Since 1987, [NCUR](#) has served as the Council on Undergraduate Research's signature undergraduate research event. It is dedicated to promoting and celebrating undergraduate research and creative endeavors in all fields and from undergraduates attending institutions nationwide. Students submit an abstract of their research or creative work and are competitively selected to present their work in forms such as oral, poster, or visual and performing arts.

NCUR presenters also experience one of the largest graduate school expos in the country, attend plenary lectures and mentoring and leadership sessions, and network with undergraduates and faculty from other institutions. Since 2015, WVU has been represented by 19 students at NCUR, with an increase in representation beginning with the establishment of the Office of Undergraduate Research.

Seven undergraduate WVU students were selected to present their research at NCUR 2020, which was scheduled to be held at Montana State University (Bozeman, MT) from March 25-March 29, 2020. This conference was cancelled due to COVID-19.

Accepted Abstract: *Purification of Genetically Detoxified Pertussis Toxin.* **Annalisa Huckaby** (Annalisa, a chemistry and biology double major at WVU from Morgantown, WV, carried out research with Mariette Barbier.) [Link to Annalisa's abstract.](#)

Accepted Abstract: *The Influence of Short Chain Fatty Acids on Intestinal Epithelial Cell Activity.* **Quinn Hopen** (Quinn, an immunology and medical microbiology major from Sutton, WV, carried out research with Candice Brown.) [Link to Quinn's abstract.](#)

Accepted Abstract: *Prioritizing Diversity in Western Music History Curriculum.* **Kayla Tokar** (Kayla, a music major from Uniontown, PA, carried out research with Travis Stimeling.) [Link to Kayla's abstract.](#)

Accepted Abstract: *Functional Expression of Genes from Selenium Hyperaccumulator Plant *Stanleya Pinnata* in *Arabidopsis Thaliana*.* **Janna Kleinsasser** (Janna, a biochemistry major from Rifton, NY, carried out research with Jonathan Cumming.) [Link to Janna's abstract.](#)

Accepted Abstract: *Parental Antecedents and Adolescent Consequences of Parental Psychological Control.* **Julie Gilmore and Sarah Segear** (Julie, a biochemistry major from Rifton, NY, and Sarah, a psychology major from Nanty Glo, PA, carried out research with Aaron Metzger.) [Link to Julie and Sarah's abstract.](#)

Accepted Abstract: *Rapid and Ultra-Sensitive Detection of Foodborne Pathogens Using Volatile Organic Compound (VOC) Bio-Markers.* **De'Anthony Morris** (De'Anthony, a human nutrition and foods major from Dayton, OH, carried out research with Jacek Jaczynski.) [Link to De'Anthony's abstract.](#)

POSTERS ON THE HILL

Megan Lauris was WVU's fifth consecutive student representative at the Council on Undergraduate Research's 24th annual [Posters on the Hill \(POH\)](#) event. The POH selection process is rigorous and highly competitive and typically only one student per state is invited to present and meet congressional staff members, federal government officials and representatives from federal funding agencies. The 2020 POH event was to have been held in-person and in Washington, D.C. on April 20-21, 2020 but the COVID-19 pandemic intervened. Instead, the POH event was held virtually on Twitter from 12-8 pm on April 21, 2020.

Megan, a Biochemistry major from Toronto, OH, was one of only 60 students selected to present her research from a nationwide pool of about 400 applicants. Under the direction of Dr. Samantha D. Minc of the Cardiovascular and Thoracic Surgery – School of Medicine Robert C. Byrd Health Sciences Center, Megan conducted qualitative interviews of healthcare workers and patients to examine the barriers to preventing amputations. The population in West Virginia is at higher risk of leg amputation compared to the rest of the U.S. due to three factors – high rates of diabetes, tobacco use, and cardiovascular disease in the state. Megan's research has a direct impact on the health of West Virginia's populace. Megan carried out undergraduate research with Minc for two and a half years and is currently attending medical school at WVU.

Poster Presentation: *Understandings Diabetes and Vascular Disease-Related Amputations in West Virginia.* **Megan Lauris** and [Samantha D. Minc](#) (Megan, photo to right, was an undergraduate biochemistry major at WVU from Toronto, OH. Megan is a current medical student. [Link to Megan's Twitter presentation.](#))



“My mentor is wonderful. She made me jump in with both feet instantly – made me do things I hadn't experienced before. I've learned so much. I'd really like to make a difference in whatever way I can.” – Megan Lauris

TRAVEL AWARDS – BEYOND WEST VIRGINIA

Besides funding student presentations of their scholarly activities at national CUR events (e.g., NCUR and Posters on the Hill) and at the statewide Undergraduate Research Day at the Capitol, UGR offers competitive travel funding, much of which is connected to participation in summer research programming (i.e., SURE enrichment funding). Travel funding offsets the costs associated with attendance and presentation (oral or poster) of research or creative work at national or regional discipline specific conferences. The application process is competitive. Students must (i) provide the submitted abstract and proof of its acceptance, (ii) devise and submit a realistic travel budget, and (iii) provide a letter of support from their faculty research mentor.

It has been a tough year for WVU undergraduates in terms of presenting their research at national and regional disciplinary conferences. In mid-March 2020 and in response to the COVID-19 pandemic, WVU justifiably put the brakes on all university-affiliated travel by faculty, staff, and students. At least 17 undergraduates had their research accepted for presentation at conferences that were later cancelled due to the pandemic. However, WVU's undergraduates quickly pivoted and many presented at WVU's virtual spring symposium instead. We are proud of our undergraduates who continued to engage in research and virtual presentation opportunities through this time of disruption. They modified their expectations and remained engaged in research through adversity.

Presentations by the undergraduate students listed in Table 1 have or would have been partially supported by the Office of Undergraduate Research.

Table 1. Undergraduates supported in travel, or who had abstracts accepted, to present their scholarly activities at national or regional discipline-specific conferences. Conferences post March 14 were cancelled as noted in red. Presentations partially supported using SURE enrichment funds are designated with a superscript S. Presentations partially supported using UGR travel funding are designated with a superscript T.

Undergraduate Presenter(s) (Major)	Faculty Mentor	Presentation Title	Conference Title, Location	Conference Dates
Meredith Phillips ^S (Biomedical Engineering)	Jessica Allen	<i>The Perception Threshold of External Disturbances in Locomotion in Healthy Young Adults</i>	Biomedical Engineering Society Annual Meeting, Philadelphia, PA	Oct 16-19, 2019
Katherine Lee ^S (Immunology and Medical Microbiology)	Edwin Wan	<i>Visualization of Innate Immune Cell Pathogenicity Post Ischemic Stroke Using Histopathological Techniques</i>	Autumn Immunology Conference, Chicago, IL	Nov 22-25, 2019
Reese Boucher ^S (Physics)	Aldo Romero	<i>Bayesian Calibration Assisted by Markov Chain Monte Carlo in DFT+U for Iron Compounds</i>	American Physical Society March Meeting, Denver, CO	March 2-6, 2020
Emily King ^T (Psychology)	Nicholas Turiano	<i>Personality Traits Affect Stress Levels Through Sleep Quality</i>	The Eastern Psychological Association Conference, Boston, MA	March 12-14, 2020 (conference cancelled)
Sherley Vazquez Colon ^T (Psychology)	Nicholas Turiano	<i>Impulsivity Levels Predict Sexual Behaviors During the Transition to College</i>	The Eastern Psychological Association Conference, Boston, MA	March 12-14, 2020 (conference cancelled)
Madison Johnston ^T (Psychology)	Nicholas Turiano	<i>Impulsivity and Alcohol Use During the College Transition: Does Helicopter Parenting Matter</i>	The Eastern Psychological Association Conference, Boston, MA	March 12-14, 2020 (conference cancelled)
Wendy Jent ^S (Immunology and Medical Microbiology)	Paul Chantler	<i>Pilot Study: The Role of Chronic Stress on Brain Microvessel Density in Male and Female Mice</i>	Environmental Biology Conference, San Diego, CA	April 4-7, 2020 (conference cancelled)
Melanie Quick ^T (Psychology)	Aaron Metzger	<i>Youth Engagement in Community Groups</i>	The Eastern Psychological Association Conference, Boston, MA	March 12-14, 2020 (conference cancelled)
Justin Huffman ^T (Chemistry)	Benoit Driesschaert	<i>Development of Enzyme Responsive Spin Probes for Non-Invasive Imaging of Enzyme Activity by EPR</i>	American Chemical Society National Meeting, Philadelphia, PA	May 22-26, 2020 (conference cancelled)
Sarah Segear ^T (Psychology)	Aaron Metzger	<i>Predictors of Psychological Control: Negative Parenting Behavior Predicts Adolescent Behavior</i>	The Eastern Psychological Association Conference, Boston, MA	March 12-14, 2020 (conference cancelled)
Tanisha Adams ^T (Anthropology)	Susanna Donaldson	<i>Racial and Ethnic Minorities Majoring in Anthropology, Sociology, and Women's and Gender Studies: Experiences in and Perceptions of Inclusion in Three Academic Fields</i>	Society for Applied Anthropology Annual Meeting, Albuquerque, NM	March 17-21, 2020 (conference cancelled)
Talia Buchman ^T (Anthropology) and Daniel Dillon ^T (Anthropology)	Susanna Donaldson	<i>Cultural Knowledge and Perception of Cancer and Cancer Healthcare Among a College-Going/College-</i>	Society for Applied Anthropology Annual Meeting, Albuquerque, NM	March 17-21, 2020 (conference cancelled)

		<i>Educated Population in North Central West Virginia</i>		
Samantha Hensley ^T (Anthropology)	Susanna Donaldson	<i>The Difference Between Child Labor and Chores on Farms in Appalachia According to Farm Workers</i>	Society for Applied Anthropology Annual Meeting, Albuquerque, NM	March 17-21, 2020 (conference cancelled)
Julian Bender ^T (Psychology)	Corey Colyer	<i>The Waiting Period: How the Court System and Prison System Reflects One Another</i>	North Central Sociological Association Annual Conference, Cleveland, OH	March 26-29, 2020 (conference cancelled)
Jessica Geczo ^T (Criminology)	Corey Colyer	<i>Plea Bargaining and Manipulation of Justice Within The "Justice" System</i>	North Central Sociological Association Annual Conference, Cleveland, OH	March 26-29, 2020 (conference cancelled)
Kaley Vestal ^T (English)	Thomas Sura	<i>Commonplace Books and the Formation of Research Identities</i>	Conference on College Composition and Communications, Milwaukee, WI	March 24-28, 2020 (conference cancelled)
Rachel Costa ^T (Criminology)	Corey Colyer	<i>Chaos in the Courts</i>	North Central Sociological Association Annual Conference, Cleveland, OH	March 26-29, 2020 (conference cancelled)
Emma Cohen ^T (Criminology)	Corey Colyer	<i>Misdemeanor Offender Management in Place of Justice</i>	North Central Sociological Association Annual Conference, Cleveland, OH	March 26-29, 2020 (conference cancelled)
Kaitlin Bailey ^T (Criminology)	Corey Colyer	<i>The Pressure to Plead</i>	North Central Sociological Association Annual Conference, Cleveland, OH	March 26-29, 2020 (conference cancelled)
Molly Powney ^S (Chemistry)	Blake Mertz	<i>pH (Low) Insertion Peptide: Thermodynamic Cycle Illustrates Binding Properties of pHLIP in POPC Bilayer</i>	American Chemical Society Southwestern Regional Meeting, Columbus, OH	May 27, 2020 (conference cancelled)

SUMMER UNDERGRADUATE RESEARCH EXPERIENCE (SURE)

The [WVU SURE Site](#) has been continuously funded since 2005. Full-time immersion in research and moving participants toward research independence are the primary goals of the SURE experience. Facilitated research, trainings, workshops, career mentoring seminars, and research presentations (i.e., Summer Undergraduate Research Symposium) improve participants' understanding of the research enterprise and the value of continuing their education post-undergraduate. ***To date, we are aware of 126 publications with SURE participants as undergraduate co-authors. For instance, 44 different 2017-2020 SURE participants are listed as co-authors on 62 peer-reviewed publications!***

In October 2020, [Michelle Richards-Babb](#) and [Rita Rio](#) submitted a proposal for renewal funding of the SURE Site. The proposal was successful garnering three more years (2020-2022) of funding as provided by the WV Higher Education Policy Commission's [Division of Science and Research](#) along with funding committed by the WVU Colleges of Creative Arts and Education and Human Services; Chambers College of Business & Economics; Davis College of Agriculture, Forestry and Consumer Sciences; Eberly College of Arts and Sciences; Statler College of Engineering and Mineral Resources; Health Sciences Center; the Departments of Biology and Chemistry; Research Corporation; and the Provost's Office.





During Summer 2020, the COVID-19 pandemic triggered the closing of the WVU campus to undergraduates. Summer research programming at institutions across the nation was cancelled or delayed. Quickly pivoting, Richards-Babb and Rio decided to administer the 2020 SURE program albeit in virtual form and reduced relative to student participants. Overall, 31 undergraduates participated in eight weeks of full-time faculty mentored virtual research during the 2020 SURE program. Twenty-six (26) undergraduates were



funded by the WVU SURE Site. The remaining five (5) undergraduates were funded through an NSF-funded Louis Stokes Alliance for Minority Participation (LSAMP) STEM Pathways and Research Alliance Phase III grant (LSAMP-1826763; PI: David Miller). Twenty-four SURE positions have been reserved for the 2021 SURE Site assuming resumption of in-person research. *Thus, the 2021 SURE is expected to host a minimum of 74 SURE participants!*

During the 2020 SURE program, student participants constructed and completed faculty-mentored online research projects, received training in skills to support their research (e.g., responsible conduct of research, library search engines), and improved their research self-efficacy. Students participated in networking and career-focused workshops, and collaborated with fellow WVU SURE students, while receiving mentorship, through a one-credit research course. Students' SURE experiences have increased the students' understanding of the research enterprise (from project inception, attainment of funding, to research completion and dissemination of results) and awareness of their role in the research community's constant dialectic. The single major difference between the 2020 SURE program and past SURE programs was the virtual nature of the experience with no face-to-face interactions. Despite this, the 2020 SURE program was as similar to that of previous years as possible in the virtual format.

We are fortunate to have faculty members willing and excited to mentor undergraduates in research. Thirty-one (31) individual faculty members mentored SURE participants in research during the 2020 SURE program. Many other WVU faculty members, staff, and graduate students offered virtual workshops and trainings on a volunteer basis. A few examples of these offerings are shown in Table 2. Despite the COVID-19 pandemic, there were silver linings. For instance, the virtual nature of workshops enabled the inclusion of panelists from distant locales. In addition, SURE alumni readily agreed to serve as near-peer role models for workshop panels as travel was not required. SURE alumni who served as panelists for the 2020 SURE program are highlighted below.

- **Colin Lopez** (2015 SURE participant, panelist from Singapore)
- **Andrew Maloney** (2015 SURE participant, panelist from Massachusetts)
- **Afsoon Sabet** (2018 SURE participant, panelist from Mississippi)
- **Brittan Brush** (2017 SURE participant, panelist from Virginia)
- **Kensley Bergdorf** (2016 SURE participant, panelist from Tennessee)
- **Cassie Kepple** (2019 SURE Graduate Teaching Assistant, panelist from Florida)

We are so thankful for the WVU community and our SURE alumni who were so generous with their time and without whom the SURE program would not be a success!

This year, the SURE program says goodbye to graduate teaching assistant **Kacee Caster**. Kacee will graduate WVU with a Ph.D. in Chemistry in Spring 2021. She has been the lead GTA for the SURE program for the last five summers (2016-2020). Over that time, her responsibilities grew as she became more familiar with the program and more confident in her own abilities as a researcher and mentor. By the summer of 2020, Kacee served more in the role of co-instructor than as GTA. This was especially valuable for “virtual” SURE in Summer 2020. Kacee’s ability to use WVU’s institutional Learning Management System, in support of virtual teaching, was especially significant. In fact, Kacee was responsible for



“rescuing” instructors from virtual breakout rooms on more than one occasion. She monitored and mentored SURE participants and fostered their continued interest in research. Additionally, she stayed one step ahead of the SURE program and was always prepared for the next assignment, speaker, or workshop event. It goes without saying that we will greatly miss Kacee and her support of the SURE program during 2021. *Good luck Kacee!*

Table 2. Sampling of workshops, trainings and other events offered to SURE participants and the broader WVU community as part of the 2020 SURE program.

Title	Presenter
Philanthropy: Using Your Skills for Good	Katy Ryan (Professor, Dept. of English & Founder Appalachian Prison Book Project), Jim Kotcon (Assoc. Prof., Plant Pathology, WV Sierra Club & Environmental Policy and Advocacy), Bradley Wilson (Assoc. Prof, Dept. of Geography) & Megan Govindan (Service Instructor, Center for Resilient Communities)
Interviewing Skills – Perform Under Pressure	Robert Barricelli (Career Development Specialist, Career Services Center, WVU)
How to Efficiently Read Research Papers	Fabien Goulay (Associate Professor, Dept. of Chemistry) & Laura Brady (Professor, Dept. of English)
National Science Foundation Graduate Research Fellowship	Eric Myers (Program Coordinator, ASPIRE Office) & Cate Johnson (Asst. Director, ASPIRE Office)
Career Mentoring Panel	Colin Lopez (Senior Strategy Associate, Fullerton Health, Shwarzman Scholar & Fulbright Fellow), Trevor Rudy (Associate Director of Engineering, Pratt & Whitney), Bridget Hayes Russell (Director of People, ALULA) & Rachel Lee Tani Walker (Assoc. Service Fellow, NIOSH)
Creating an Effective Research Presentation	Michelle Richards-Babb (Director, WVU Office of Undergraduate Research)
Graduate Life: The Real Story	Afsoon Sabet (Biology, MS Biology, Miss State), Brittany Brush (Geography, MS Civil Eng, FL State U & Waste Disposal Authority Engineer for Savannah River Remediation), Cassie Kepple (Psychology & MDS, PhD Higher Educ, FL State U), Kensey Bergdorf (IMMB, PhD Pharmac, Vanderbilt U), & Andrew Maloney (Chem Eng, PhD Chem Eng, MIT)
Undergraduate Panel for Current Upward Bound Students	Landon Southerly (Director, WVU Upward Bound/TRIO)
Writing Personal Statements - Telling your Story to Funders and Admissions Committees	Amy Cyphert & Eric Myers (ASPIRE Office, WVU)

SUMMER RESEARCH PROGRAMMING – BEYOND SURE

The SURE program is one of several structured summer undergraduate research programs that takes place on the WVU campus each summer. UGR works with program directors and faculty members to coordinate educational programming including professional development and the culminating symposium. Because of the COVID-19 pandemic, all of the summer research programs listed below were cancelled in 2020. Assuming resumption of in-person research, we do expect that all summer undergraduate research programming will take place in 2021.

- **Chemistry REU (PI: Brian Popp, co-PI: Michelle Richards-Babb)** National Science Foundation (NSF) Division of Chemistry (CHE 1852369) with recreational activities funded by WVU Research Corporation and the WVU Eberly College of Arts and Sciences.
- **Robotics REU (PI: Yu Gu, co-PI: Jason Gross)** National Science Foundation (NSF) Division of Computer Science and Engineering (CSE-1851515).
- **Immunology and Medical Microbiology Research Internships (Coord: John Barnett and Rosana Schafer)** Financial support for the internships comes from the Department of Microbiology, Immunology and Cell Biology.
- **WVU Cancer Institute Summer Undergraduate Research Program (Coord: Alexey Ivanov)** Financial support for the fellowship program comes from the Edwin C. Spurlock Fellowship Fund, the Edward L. Reed Cancer Research Endowment, the Dr. David B. McClung Cancer Research Endowment Fund, and the Joe Marconi Cancer Research Fellowship Endowment.
- **Undergraduate Water and Energy Systems Scholars (Director: Shawn Grushecky)** Funded under the NSF EPSCoR project “Improving Water Management, Treatment and Recovery in Oil and Gas Production” – a joint project between the University of Kansas and WVU.
- **Summer Undergraduate Vision Research Fellowship (PI: Jianhai Du)** Funded by the WVU Health Sciences Center Research and Graduate Education and the Department of Ophthalmology.



In July 2020, WVU through the Office of Undergraduate Research was one of nine (9) West Virginia institutions to host a NSF-funded First2 Network Summer Immersive Research Experiences site for rising freshmen college students intending to major in STEM disciplines. The [First2 Network](#) is funded by an NSF INCLUDES grant. The goal of the First2 Network is to double the graduation rate of STEM majors in West Virginia in 10 years. The First2 Network focuses on first-generation college students and other underrepresented students in their first two years of college and is engaging in forming statewide collaborations between academia, industry, non-profits, state government, and K-12.

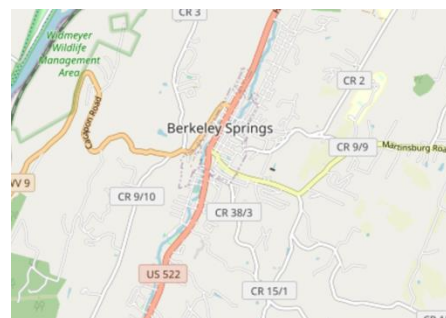


Despite the COVID-19 pandemic, site directors from all nine sites quickly modified the programming from in-person to online and offered two-week virtual research experiences. A total of thirteen (13) rising freshmen, most matriculating into WVU, attended WVU's two-week site and engaged in research, team-building, formation of the cohort, and acclimation to academia and the virtual learning environment. Three advanced undergraduate mentors from WVU, **Hannah Petronek** (biochemistry), **Autumn Rogers** (immunology and medical microbiology), and **Aubrey Cumberledge** (biology), all of whom are also first-generation college students, aided in internship planning and provided near-peer mentoring for the duration of the two-week site and beyond.



WVU's 2020 "Virtual" NSF-funded First2 Summer Immersive Research Experience. Participants and mentors learned about the chemistry of diapers from their homes! They ripped apart diapers, collected the sodium polyacrylate active ingredient, and added water. All were amazed by the huge amount of water absorbed by the small amount of sodium polyacrylate contained in diapers.

Two research projects, originally intended to be in-person, were reframed for virtual delivery. Dr. Brent McCusker aided by graduate student **Jaimee Pyron** led the geography-focused project entitled "Mapping Appalachia". Participants and mentors mapped rural Appalachian communities' most pressing social-economic development needs. They were instructed in use of the free, publicly accessible OpenStreetMap database to map their home communities, especially those not fully mapped, and add critical context to their maps. A biology-focused research project entitled "Fish in a Dish" was led by Dr. Sadie Bergeron and graduate student **Rebecca Coltogirone**. In this project, participants and mentors learned about zebrafish, a vertebrate model organism used in research related to human and environmental health. Using a pre-mailed water testing kit, participants sampled local waterways to assess levels of contamination. They proposed zebrafish experiments for researching questions related to the effects of pollutants on the development of zebrafish embryos. All participants engaged in both virtual projects. Each student presented their research in a culminating virtual oral presentation.



Two WVU-affiliated persons, Kathryn Williamson (Physics Teaching Associate Professor) and Michelle Richards-Babb (Chemistry Professor and Director of UGR) were responsible for ensuring the success of WVU's 2020 First2 Network Summer Research Immersion. Along with site directors from the other eight sites, Williamson and Richards-Babb advertised the opportunities, reviewed applications, selected participants, assessed participant internet and computer needs, purchased and shipped supplies, devised virtual research, and ran the two-week program. Workshops to ease participant transition to college were sprinkled throughout the afternoons and included the following:

- "Understanding the COVID-19 Pandemic: The Key to Control," presented by Rita Rio (Biology)

- “How to be an Anti-Racist,” national presentation by Ibram X. Kendi
- “Mental Health: Stigma and Reaching out for Help,” presented by Kayla Meador and Stephanie Harrison (Carruth Center)
- “Climate Change in the Mountain State” and “How to Become a Science Public Outreach Team (SPOT) Ambassador,” presented by Kathryn Williamson (Physics)
- “Responsible Conduct of Research,” presented by Michelle Richards-Babb (Chemistry & UGR)
- “Graduate and Professional School,” panel presentation organized by WVSoM
- “How to Get Involved in Undergraduate Research During the School Year,” presented by Cinthia Pacheco and Paige Zalman (UGR)
- “Navigating Financial Aid” and
- “Teach Yourself How to Learn” Book Club

The internship was assessed by the First2 Network’s evaluation team (Caitlin Howley) using pre- and post-surveys. Participants overwhelmingly indicated that the “*experience will help them succeed in college*” and that “*the things learned will help them stay in STEM major when coursework is challenging*”.

In November 2020, UGR’s Richards-Babb and Pacheco along with the Williamson (Physics) submitted WVU’s letter of intent to the First2 Network to write a proposal for hosting of a 2021 two-week Summer Immersive Research Experiences site. *Fingers crossed that our proposal is successful!*

RESEARCH APPRENTICESHIP PROGRAM – BEYOND SUMMER

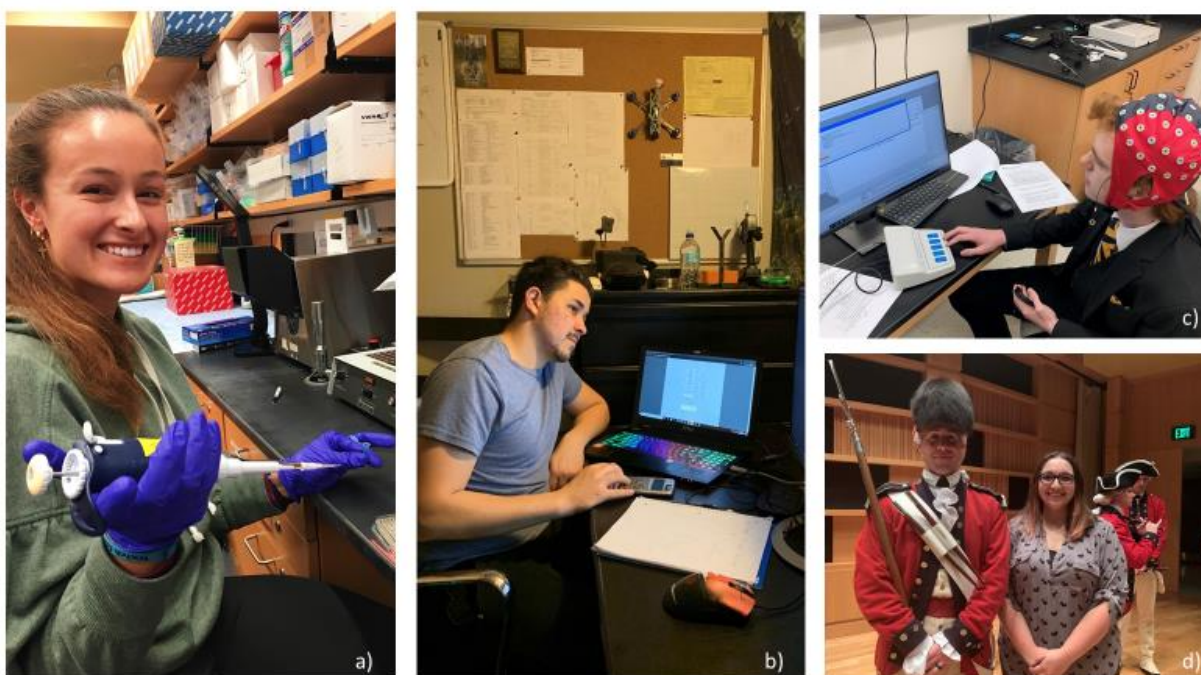
The Research Apprenticeship Program (RAP) is a course-based undergraduate research experience that allows students to serve as apprentices for faculty members conducting research at WVU. RAP was established in fall 2017 and is designed for students with little to no research experience in research. The goal of the program is to help students advance career outcomes, explore academic passions, and gain access to the real-world application of their studies. RAP also expands scholarly opportunities for undergraduate students, facilitates their introduction to the concept of scholarship in their field, and improves their persistence within the major and at WVU. Students within the program conduct research across a broad spectrum of academic fields, including but not limited to research in STEM disciplines, arts, humanities, social science, and clinical research. Undergraduate students in the program may earn course credit or may use Federal Work-Study (FWS) funds to be paid for work in their research spaces.

Building on the growth of student participation in previous semesters, in Spring 2020 there were 65 new students that began RAP-Part I (first semester, introductory experience), while 119 continued from the previous semester into RAP-Part II (second semester, leveraging curriculum). In fall 2020, 110 new students began RAP-Part I, while 53 others continued from the previous semester to RAP-Part II. It is important to mention that during the 2020 spring cohort, the COVID-19 pandemic hit the country, which led WVU to adapt in order to mitigate the spread of coronavirus. This had a particular impact on undergraduate research since WVU guidelines prioritized graduate research. More specifically, undergraduate researchers should not displace graduate researchers and faculty research space should accommodate the 200 sq feet per person space. Under this condition, many faculties had to decline accommodating undergraduate students to their research spaces. Despite the challenging situation, RAP had only about 10% reduction on the total number of students enrolled in RAP-Part I and RAP-Part II. The pandemic had almost no impact on the number of students who continued as RAP Graduates, as shown in Table 3.

Table 3. Number of students engaged in research via the Research Apprenticeship Program (RAP) from the pilot year (Fall 2017) to the Fall 2020 semester.

RAP Course	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020
RAP-Part I	52	33	146	55	138	65	110
RAP-Part II		43	18	112	40	119	53
RAP Graduates			22	26	38	31	34
Totals	52	76	186	193	216	215	197

“RAP Graduates” represent the number of students continuing research after RAP by using FWS funding supervised by the RAP program. Though many other RAP graduates continue research via course credit, volunteering, or through funding provided by their mentors, these students are tracked in other ways (see the Institution-Wide Outcomes section).



RAP researchers in their research spaces. From left to right: a) Grace Maley (biochemistry major), b) Jacob Loverde (computer science major), c) Parker Carte (multidisciplinary studies major), and d) Elizabeth Rockwell (music performance major).

Research and programmatic evaluation of the RAP program were conducted by Dr. Natalie Shook (Psychology) and Dr. Paul Hernandez (Educational Psychology) who investigated the academic performance and persistence of FWS funded RAP participants compared to a control group of students who did not participate in the RAP program. The mediation analysis of their study revealed that “research identity as a significant mediator in the relationship between RAP status and STEM persistence. Furthermore, RAP participants were able to create longer bonds with their faculties and integrate more into the academic community” (Hashemi, Mostafa, "An Examination of the Impacts of the WVU Research Apprenticeship Program (RAP)" (2020). Graduate Theses, Dissertations, and Problem Reports. 7565. <https://researchrepository.wvu.edu/etd/7565>). In addition, Dr. Kimberly Quedado (former Director of the RAP Program) began RAP program evaluation that surveys current RAP-Part I and II students several times throughout the semester on curriculum and the development of their researcher identities. Finally, Carinna Ferguson who started as RAP graduate teaching assistant and is currently a doctorate student in Learning Science, conducted her master’s thesis research on the RAP program’s influence on arts and humanities students (Ferguson, Carinna F., "Experiences of Arts and Humanities Students Engaging in Undergraduate

The RAP program's success would not be possible without our graduate teaching assistants (GTAs) who teach the coordinating RAP classes and provide near peer mentoring for all RAP participants. We are thankful for our four 2019–2020 GTAs, Carinna Ferguson (Educational Psychology), Madison Brooks (Counseling), Stephanie Augustine (Wildlife and Fisheries), and Alex Davidson (Accountancy), and to our three 2020-2021 GTAs, Carinna Ferguson (Learning Science), Stephanie Augustine (Wildlife and Fisheries), and Morgan Simpson (Elementary Education). Additionally, in fall 2019 the RAP program piloted use of an advanced undergraduate as teaching assistant for the RAP course. UGR Ambassador and RAP graduate, Kayla Tokar (Music), was assigned as an undergraduate teaching assistant for one section of the RAP-Part I class in exchange for HONR 490 course credit (2 credits). Kayla has gone above and beyond as a RAP teaching assistant and continued in this role in the spring 2020 semester, where she was joined by a second UGR Ambassador and RAP graduate, Kaley Vestal (English), who acted as our second pilot undergraduate teaching assistant. In fall 2020 another undergraduate teaching assistant, Parker Carte (Multidisciplinary studies), joined the RAP team.

The training of advanced undergraduate students to work as instructors for HONR 297 presents as a possibility to expand the Program without increasing the number of students/class or increasing the budget to hire more GTAs. Therefore, starting in fall 2020 Raven Forshee (Biology) was assigned to shadow a GTA to prepare to instruct one section of HONR 297 in Spring 2021 in exchange for HONR 490 course credit (1 credit).

Finally, the RAP program would not exist without the support of WVU's generous faculty members who help our undergraduate researchers pursue their passions. We are particularly grateful this year of 2020 that, due to COVID-19 pandemic, faculties went above and beyond to provide undergraduate students with a meaningful research experience.

BECKMAN SCHOLARS PROGRAM – YEAR-ROUND RESEARCH

The Office of Undergraduate Research actively pursues funding to support undergraduate research and creative endeavors. In June 2019, UGR wrote its third iteration of a proposal to the [Arnold and Mabel Beckman Foundation](#) to fund undergraduate research. In September 2019, UGR was informed that its submission had “successfully completed phase one of the 2020 Beckman Scholars Program selection procedure” and was one of 26 finalists. Then, in January 2020, UGR was informed that it was **one of 12 institutions nationwide** awarded to receive \$156,000 of funding from the Arnold and Mabel Beckman Foundation to establish a [Beckman Scholars Program at WVU](#). This award provides six (6) high-achieving students with the opportunity to engage in 15-months of continuous, immersive research, full-time for two summers and part-time for one academic year. Selected students earn the title of Beckman Scholars and receive \$21,000 of funding (stipend and supply/travel). Their faculty research mentors also receive \$5,000 to be used in support of the Beckman Scholars' research projects.

Awarded students must have current and sustained interest in research and plan to earn advanced degrees and contribute to the scientific and research enterprise as both innovators and scientific leaders. Awards can only be made to students with research in the areas of biology, biochemistry, chemistry, and medical sciences as well as interdisciplinary combinations of these fields. In addition, awarded students must engage in research with one of the 13 “approved” Beckman Faculty Research Mentors as listed below. These faculty were approved for mentoring of Beckman Scholars as part of the proposal submission. Each provided information on undergraduates mentored over the last five years – number, average duration of mentoring, number of research presentations by undergraduates and number of undergraduate co-authors – and devised a one-page statement of how they would mentor a Beckman Scholar.

Approved Beckman Faculty Research Mentors include:

- [Sadie Bergeron](#) (Biology/Developmental Neuroscience)
- [Andrew Dacks](#) (Biology/Neuroscience)
- [Kevin Daly](#) (Biology/Neuroscience)
- [Cerasela Zoica Dinu](#) (Chemical & Biomedical Engineering)
- [Jennifer Gallagher](#) (Biology)
- [Lisa Holland](#) (Chemistry/Analytical)
- [Jessica Hoover](#) (Chemistry/Organic)
- [David Klinke](#) (Chemical Engineering)
- [Justin Legleiter](#) (Chemistry/Biophysical)
- [Blake Mertz](#) (Chemistry/Biophysical)
- [Daniel Panaccione](#) (Plant and Soil Sciences)
- [Brian Popp](#) (Chemistry/Organic)
- [Janet Tou](#) (Human Nutrition and Foods)

The selection process is rigorous. A five-page research project proposal accompanies the standard application. Applications are reviewed and winnowed, and competitive applicants are invited to give an oral presentation to the Beckman Scholars Committee, which includes Chairs of Chemistry, Biology, and Plant Science, the Director of UGR, and the Dean of the Honors College. The Committee is looking for the nation's future scientific leaders who will lead in scientific research and innovation, as well as in training the next generation of scientists, and who can coherently and enthusiastically discuss, teach, and explain their research.

Despite the COVID-19 pandemic, the WVU Beckman Scholars Committee selected WVU's first two Beckman Scholars, **Abreanne Andlinger** (left) and **Kelcie Britton** (right), in May 2020. Abreanne is from Moundsville, WV and is a current junior majoring in Biology at WVU. For her Beckman Scholar project, "*Elucidating target genes of Genomic Screen Homeobox transcription factors Gsx1 and Gsx2 using zebrafish*," she is mentored by [Sadie Bergeron](#) (Biology). Kelcie Britton is from Morgantown, WV and is a current junior majoring in Immunology and Medical Microbiology at WVU. For her Beckman Scholar project, "*Functional and Genetic Analysis of Esterase Genes Involved in Synthesis of Ergot Alkaloids*," she is mentored by [Daniel Panaccione](#) (Plant and Soil Sciences). Both Abreanne and Kelcie are leaders in the undergraduate research community and have engaged in telling the stories of WVU's undergraduate researchers. For instance, they have aided UGR in [spotlighting](#) current students involved in undergraduate research. As Beckman Scholars, Abreanne and Kelcie will represent WVU and the state of West Virginia on the national stage at Beckman events. *We are very proud of WVU's first two Beckman Scholars and look forward to their continued leadership in scientific research and innovation.*



FUNDING FOR UNDERGRADUATE RESEARCH

2020 has been a successful year for UGR in terms of funding for undergraduate research. The WVU SURE site (2020-2022) was refunded for the sixth time! Institutional commitments totaling \$167,000 per year were obtained from the WVU Colleges of Creative Arts and Education and Human Services; Chambers College; Davis College; Eberly College; Statler College; Health Sciences Center; the Departments of Biology and Chemistry; Research Corporation; and the Provost's Office. Along with the

\$75,000 per year requested from the WV Higher Education Policy Commission's Division of Science and Research, the award brings in \$242,000 per summer for three years in support of 50 undergraduate researchers per summer. This amounts to \$726,000 in support of 150 undergraduate researchers.

In January 2020, UGR received \$156,000 from the Beckman Scholars Program at WVU to support and mentor six (6) undergraduate researchers over three years. The Beckman Scholars Program is the most prestigious undergraduate research program at WVU and supports students who will be national leaders in research and innovation.

In February 2020, UGR was awarded funding to administer a two-week First2 Network Summer Immersive Research Experiences Site at WVU. UGR received \$19,000 of NSF First2 administered funding with an additional \$3,000 committed by the WVU Departments of Biology and Chemistry. Thirteen (13) rising freshmen, first-generation or other underrepresented students intent on STEM majors, were supported in "virtual" research during Summer 2020.

In total, UGR brought in \$400K of external funding in support of undergraduate research programming in 2020!

UGR regularly supports faculty members who include funding for undergraduate researchers in their proposals. UGR provides typical funding levels for undergraduate researchers or sites and a list of UGR offered summer and academic year activities that support undergraduates in research. UGR offers advice on administering undergraduate research sites or a few undergraduates in research. Offerings include template letters and contracts, mentoring handouts, advice stipend pay set-up, and contacts for housing, Mountaineer cards, and supplemental insurance. More recently, we have provided advice on how to run "virtual" symposia as, after running three, we have quite a bit of experience in this area. In addition, UGR has become well known on the national stage and we receive requests for conversations about establishing an institutional Office of Undergraduate Research. As documented below, UGR has provided thoughtful, collegial support, conversations and/or coaching to faculty and staff at WVU and at organizations outside of WVU.

Faculty and Staff at WVU

- Yu Gu and Jason Gross (Mechanical and Aerospace Engineering; [Robotics REU Site](#)),
- Kimberly Quedado (Emergency Medicine; undergraduate researchers),
- David Miller (Mathematics; [NSF-funded LSAMP program](#))
- Brian Popp (Chemistry; [Chemistry REU Site](#)),
- Shawn Grushecky (Energy Land Management; Kansas-WV REU Site),
- Duncan Lorimer (Physics/Eberly College; administering in-person and virtual symposia),
- Logan Miller & Alexey Ivanov (HSC Research and Graduate Education; administering virtual symposia, UGR workshops)
- Craig Barrett (Biology; NSF CAREER proposal support letter)
- Bingyun Li (Orthopaedics; NSF proposal support letter)
- Jessica Allen (Chemical and Biomedical Engineering; NIH R15 proposal support letter)
- Julie Hicks (Psychology) & Betty Mei (Graduate Education and Life) (advert of NIH-funded [AGE-ADAR](#))
- Loren Anderson (Physics) & Holly Legleiter ([Astrophysics REU Site](#))
- Katie Kestner (Psychology; NSF REU Site proposal advice)
- Devin Kelly ([Undergraduate Research Association](#) student club; workshop advertisement)
- Michael Hu (Microbiology, Immunology and Cell Biology; researcher needed advertisement)
- Dina Jones (Orthopaedics; researcher needed advertisement)
- Sunil Sharma (Pulmonary/Critical Care and Sleep Medicine; researcher needed advertisement)

Faculty and Staff Outside of WVU

- Carolyn Price (University of Cincinnati) & Lisa Salati (HSC Research and Graduate Education ([Cincinnati Prep](#) program letter of support and advertisement)
- Sean Collins (WV State University) & Juliana Serafin (WV HEPC, DSR) (NSF REU Site proposal support letter)
- Erica Harvey (Fairmont State University; administering virtual symposia)
- Sanish Rai & Kenan Hatipoglu (WVU Tech; adapting and implementing RAP)
- Micheal Fultz (West Virginia State University; administering virtual URDC)
- Joseph Allen (Concord University; advertising and implementing NSF Geology REU Site)
- Iain Crawford (University of Delaware; the RAP model)
- Kaerie Ray ([Arnold and Mabel Beckman Foundation](#); administering virtual symposia)

PRESENTATIONS AT WVU AND BEYOND

UGR gives frequent presentations on a variety of topics (e.g., research ethics, creating research presentations, finding and applying for external opportunities, and introduction to undergraduate research). Highlighted below are a few of UGR's offerings - all of which were presented virtually during 2020. (Bold = main presenter; Underline = UGR staff or student)

Richards-Babb, M. "Ethics and Responsible Conduct of Research." Summer Undergraduate Research Training, May 2020.

Ferguson, C.; Caster, K. "Getting the Most from Your Mentor." Summer Undergraduate Research Training, May 2020. (Carinna Ferguson [photo right] is a two-year GTA with the RAP program. Her research also investigates and assesses undergraduate research programming. Kacee Caster is a five-year GTA for the SURE program.)



Richards-Babb, M. "Creating an Effective Research Presentation." Summer Undergraduate Research Workshop, July 2020.

Richards-Babb, M. "Ethics: Plagiarism and Research Misconduct." First2 Network Statewide Summer Research Immersion Sites, July 2020.

Walden, K.; Zalman, P.; Ferguson, C.; Petty, J. "Navigating the Mentor-Mentee Relationship." Honors EXCEL Seminar, Sept. 2020. (Jeffrey Petty [photo right] is an undergraduate student and the 2020-21 Editor-in-Chief of MURR.)



Richards-Babb, M. "Introduction to External Undergraduate Research Opportunities: How to Find and Apply." Research Apprenticeship Program – Part 2 Classes and Undergraduate Research Association, Sept. & Oct. 2020.

Walden, K. "Introduction to Undergraduate Research Networking Event." WVU Undergraduate Institution-Wide Presentation, Sept. 2020.

Richards-Babb, M. "Introduction to Undergraduate Research for Biomedical Engineering Majors." Biomedical Engineering Orientation Class (Cerasela Zoica Dinu), Oct. 2020.

Pacheco, C. "Research Apprenticeship Program (RAP): Growth through Research". West Virginia Science Teachers Association (WVSTA) conference, Oct. 2020.

Pacheco, C. “Research Apprenticeship Program at WVU: A Different Model of Undergraduate Research”. Eureka - Undergraduate Research Event at Newton Paiva University Center, Minas Gerais, Brazil, Dec. 2020.

UGR staff routinely attend Council on Undergraduate Research (CUR) conferences to advertise WVU’s successes and programming models and to improve UGR’s knowledge of nationwide trends in undergraduate research programming and funding mechanisms. In the past year, UGR staff presented their research in poster and oral forms and took part in a panel discussion on use of FWS funding to support undergraduates in research as outlined below.

Poster Presentations

Ferguson, C. “Experiences of Arts and Humanities Students Engaging in UR.” 2020 Council on Undergraduate Research Virtual Biennial Conference, June 2020.

Zalman, P. “Developing and Assessing a Multidisciplinary UR Program.” 2020 Council on Undergraduate Research Virtual Biennial Conference, June 2020.

Oral Presentations

Fultz, M.; Pacheco, C.; Richards-Babb, M. “West Virginia Academic Year Undergraduate Research Models.” First2 Network Immersion Working Group Outreach to Institutions Statewide, Nov. 2020.

Gunnels, C.; Barton, L.; Galli, D.; Johnson, S.; Richards-Babb, M. “Learning from Presenting: Self-Perceived Learning Gains from Presenting Scholarly Research.” 2020 Council on Undergraduate Research Virtual Biennial Conference, June 2020.

Richards-Babb, M. “Establishing State-Wide Summer Research Experiences for Rising First-Year Students in STEM.” 2020 Council on Undergraduate Research Virtual Biennial Conference, June 2020.

Panel Presentations

Misemer, S.; Datta, S.; Aymond, A.G.; Guentzel, A.N.; Petty, J.; Pedigo, S.; Hensley, M.K.; Davis-Kahl, S.R.; Walden, K.; Richards-Babb, M. “Publishing UR Journals at Three Institutions: Experiences After One Year, One Decade, and Adapting the New CUR Forum.” 2020 Council on Undergraduate Research Virtual Biennial Conference, June 2020. (Jeffrey Petty is an undergraduate student and the 2020-21 Editor-in-Chief of MURR.)

Cancelled Conference Presentations

Accepted Abstract: Richards-Babb, M. “The Undergraduate Research Pipeline at West Virginia University.” West Virginia Academy of Science Annual Meeting, conference cancelled in May 2020.

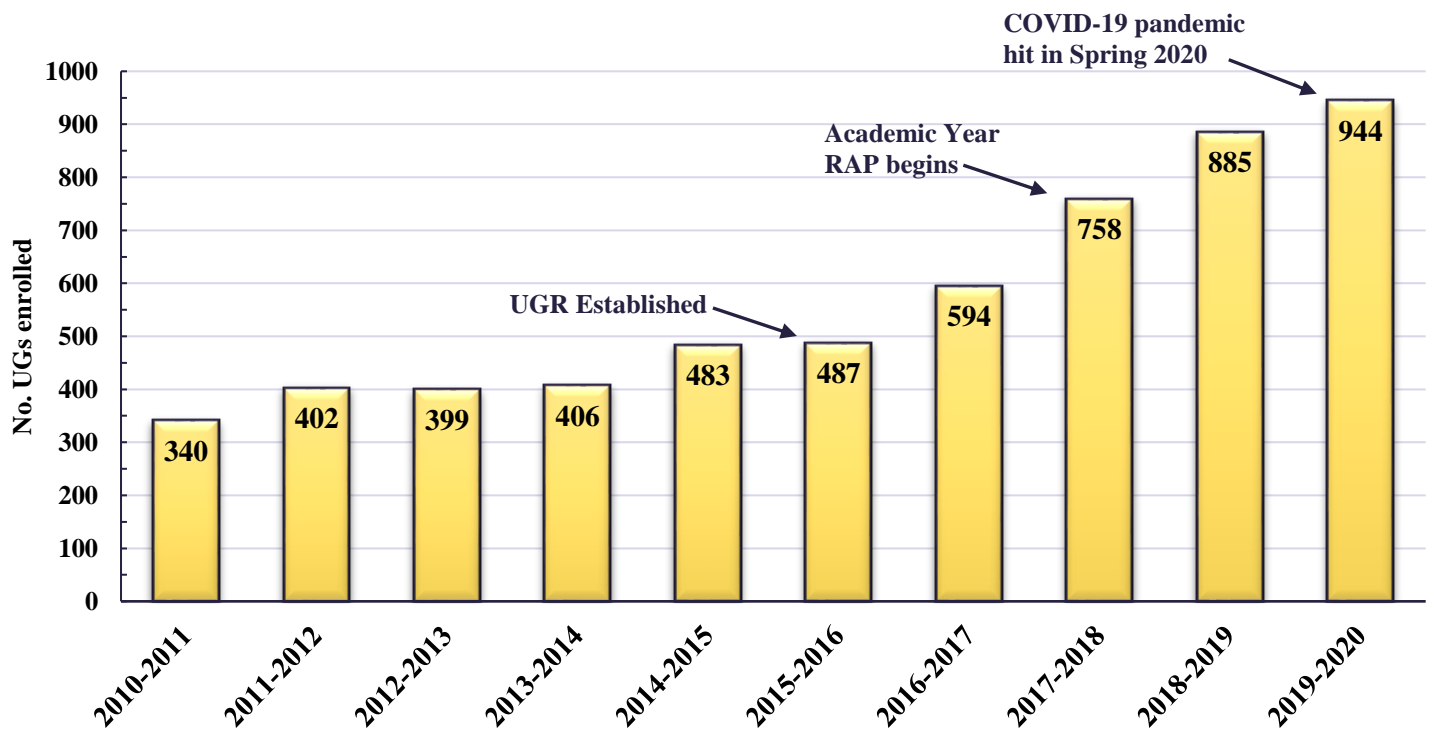
Accepted Abstract: Richards-Babb, M. “Establishing an Institution-Wide Undergraduate Research Pipeline.” Biennial Conference on Chemical Education, conference cancelled in July 2020.

In addition, UGR staff are active in the nationwide Council on Undergraduate Research (CUR) community. UGR staff post frequent questions and responses to questions in the CUR Community Member Forum. UGR’s statewide and nationwide reputation has grown over the last year. We attribute this to our dedicated graduate students and staff. *We are extremely proud of their accomplishments and their continued commitment and devotion to helping WVU’s undergraduates succeed in research and beyond!*

INSTITUTION-WIDE OUTCOMES

The Office of Undergraduate Research is engaged in institution-wide tracking of undergraduate research activities. The number of undergraduates involved in scholarly activities as measured by student enrollment in research coursework at WVU has increased dramatically since 2010-2011. Factors that have contributed to this increase are establishment (in 2015) of the centralized Office of Undergraduate Research and targeted advertisement of the benefits of doing research to incoming students. Remarkably, despite the COVID-19 pandemic, the number of undergraduates involved in research coursework actually increased in 2020! We applaud all of our WVU faculty research mentors who designed virtual research projects to keep undergraduates engaged.

Enrollment in Undergraduate Research Coursework by Academic Year



To spread the word about undergraduate research, UGR continues to visit faculty during departmental meetings. In 2020 and prior to the COVID-19 pandemic, UGR visited the WVU departments listed below.

- Mathematics
- Economics
- Extension Specialists
- Social Work
- Obstetrics and Gynecology
- English
- Pharmacy
- Management

UNDERGRADUATE RESEARCH AMBASSADORS – BEYOND UGR

The Undergraduate Research Office Ambassador (UGRAs) program was established in fall 2018 and entered its second year in fall 2019. Students serving in the ambassador program are nominated and accepted into the program based on their outstanding performance as students, commitment to research, and eagerness to discuss research opportunities with their peers. The ambassador program was paused in fall 2020 due to the impact of COVID-19 on operational budget, but is expected to continue under a pared down model in spring 2021.

Ambassadors play key roles in undergraduate recruitment and outreach due to their ability to provide testimonies on the impact research has had on their personal trajectories and their capacity to speak with near peers about getting started in or advancing their research. These student serve the office through a variety of roles, including RAP class visits, tabling for event and program recruitment, blogging, serving as research panelists, writing thank you cards, and promoting social media.

Students from the 2018-2019 school year returned as ambassadors for spring 2020 and represented a wide range of disciplines, including music (Kayla Tokar, senior), English (Kaley Vestal, junior), immunology and medical microbiology (Mya Vannoy, senior, and Quinn Hopen, junior), chemistry and biology (Janna Kleinsasser, junior, and Annalisa Huckaby, senior), forensics and investigative sciences (Oriana Ovide, senior), sociology (Colter Uscola, senior), psychology (Trinity Shaver, senior).



A special thanks goes to UGRA **Kayla Tokar**, who graduated in spring 2020 with a Bachelor of Arts degree in Music. Kayla has been an enormous asset to UGR since she began her role as ambassador in 2018. She contributed numerous hours of editing for our office's symposia booklets and website pages, took on the role of UGR Monthly editor (developing from scratch, and maintaining, our monthly email newsletter during the 2019-2020 academic year), and served as digital photographer for events and office promotions. In fall 2019, Kayla also became our first-ever RAP Undergraduate Teaching Assistant, serving as the instructor for one section of RAP's accompanying HONR-297 course in both the fall 2019 and spring 2020 semesters and serving as mentor to RAP students. Her engaging style of teaching and innovative contributions to HONR-297 curriculum throughout the year have made the RAP program stronger, and Kayla's success in this role paved the way for the RAP program's expansion in recruiting other Undergraduate Teaching Assistants. In addition, Kayla thrived as a researcher during her time at WVU—with her mentor Dr. Travis Stimeling, Kayla was a participant in the 2017-2018 cohort of the RAP program and the 2018 SURE program, and in spring 2020, Kayla was co-author on a publication in the *Journal of Music History Pedagogy* titled "Narratives of Musical Resilience and the Perpetuation of Whiteness in the Music History Classroom," an impressive feat nearly unheard of for an undergraduate in the field of musicology. Kayla's hard work and meaningful contributions to UGR and to the discipline of musicology earned her the 2020 West Virginia University



Student Employee of the Year award, presented to one student-worker university-wide per year, and Kayla was also named the Student Employee of the Year by the Midwest Association for Student Employment Administrators for the entire state of West Virginia. UGR has been so lucky and grateful to work with Kayla over the past two years, and we wish her all the best as she leaves WVU to pursue her career goals in museum curation. *Thank you, Kayla, and good luck!*

SOCIAL MEDIA OUTREACH




This year, the Office of Undergraduate Research welcomed immunology and medical microbiology senior, Quinn Hopen (photo right), to serve as its first full-time “Social Media Specialist.” This specialist manages the office’s social media accounts, designs graphics, and posts on behalf of the office. Part of Quinn’s expertise resides in the fact that she is member of the audience the office is trying to reach. Additionally, Quinn has experience in managing social media accounts for student organizations over which she presides.



The Office of Undergraduate Research expanded advertising through social media in fall 2018. In fall 2019 the office established a monthly newsletter, “UGR Monthly,” to update students and faculty members about research programming, opportunities, and upcoming deadlines. Since its inception, student workers have played a key role in editing the newsletter. In fall 2020, the newsletter was renamed “Inside Undergraduate Research,” and Quinn is currently serving as its editor. As of December 2020, the newsletter has 796 subscribers.

Survey results in fall 2018 indicated that students have a strong preference for learning about research announcements and events through the office’s Twitter and Instagram accounts. Since the office established accounts for Facebook, Twitter, and Instagram, they have continued to show steady growth. Since fall 2019, the number of followers for Facebook has grown 70%, Twitter has grown 26%, and Instagram has grown by 63% (see table below).

Summary of the Office of Undergraduate Research Social Media Growth

	Facebook 	Twitter 	Instagram 
Spring 2018	6 likes and followers	34 followers	NA
Fall 2018	65 likes and 69 followers	127 followers	218 followers
Fall 2019	105 likes and 119 followers	194 followers	372 followers
Fall 2020	173 likes and 202 followers	245 followers	606 followers
Trends in followers from Fall 2018-Fall 2019	72% increase (+50)	53% increase (+93)	70% increase (+154)
Trends in followers from Fall 2019-Fall 2020	70% increase (+83)	26% increase (+51)	63% increase (+234)

MOUNTAINEER UNDERGRADUATE RESEARCH REVIEW (MURR)

Over the 2019-2020 academic year, two students, Jeffrey Petty and Zachary Gilpin, used the Honors EXCEL program as a mechanism to lead the revitalization of the *Mountaineer Undergraduate Research Review (MURR)*. *MURR* was published online in November 2020, and a hardcopy publication is expected to follow in December 2020. The digital version of the journal is housed on the Research Repository @ WVU, a platform provided by WVU University Libraries and the Office of Research.

MURR, Volume 5 marks the return of WVU's original student-led undergraduate research journal since its lapse in 2014. *MURR* was first launched by Molly Simis, an Honors junior majoring in biology and environmental geoscience, and it saw the publication of four volumes from 2009-2014.

In fall 2019, the *MURR* Editorial Review Board (ERB) was established and consisted of the following student participants:

Editors-in-Chief: Jeffrey Petty and Zachary Gilpin

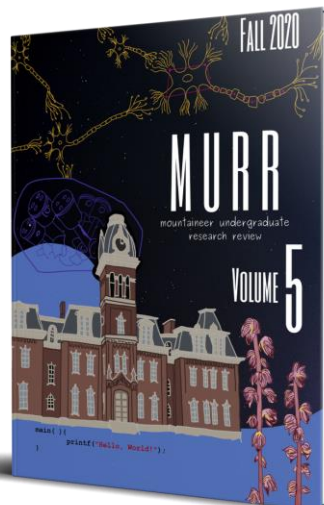
Head Section Editor (STEM): David Sokolov

Head Section Editor (HASS): Julean Bender

Subsection Editors (STEM): Gwendolyn Nurkiewicz, Janna Kleinsasser, Katherine Lee, Rachel Winslett, Savannah Hays and Teagan Kuzniar

Subsection Editors (HASS): Emily Ogden, Kailey Basham, and Kaley Vestal

Copy Editors: Benjamin Luikart, Isabelle Hidalgo, and Amelia Jones



Beginning in January 2020, the ERB began soliciting manuscripts and began training to edit incoming submissions. Training was scaffolded through a series of workshops and were facilitated by experts from around the university:

- Editing Workshop led by Dr. Laura Brady on January 24, 2020
- Copyright Workshop led by Dr. Ian Harmon on February 7, 2020
- Advertising Workshop led by Dr. Katlin Swisher on January 24, 2020
- Author Communication Workshop led by Dr. Cinthia Pacheco on March 6, 2020

The first stage of the editing process was initiated in March with student and faculty reviews. Author revisions and additional review continued through October 2020.

From May 22- September 28, 2020, *MURR* hosted a cover art contest with a cash prize. The winner for this contest was Kirsten Roys (photo right), a junior majoring in civil and environmental engineering.

In October 2020, *MURR* launched a redesigned webpage hosted by the Office of Undergraduate Research website.



VISION AND MISSION

Vision: West Virginia University's Office of Undergraduate Research envisions its program as one that will contribute to world-changing discovery and innovation, academic engagement, and excellence through its focus on scholarly inquiry that prepares students to create the ideas and opportunities that shape and advance our state, nation, and world.

Mission: The Mission of the Office of Undergraduate Research at West Virginia University is to enhance academic excellence through undergraduate research and creative endeavors. We connect undergraduate students, who have strong and committed interests in research and creative endeavors, to faculty members, programs, and research-related opportunities that are aligned with their interests. As the home of the *WVU Summer Undergraduate Research Experience (SURE)* program, we foster a culture of academic engagement by providing unparalleled opportunities for student participation in research. We work to institutionalize undergraduate research and creative endeavors as a key component of the educational experience across all disciplines at West Virginia University.

For undergraduate students, the Office of Undergraduate Research:

- offers on-campus programming including symposia and summer undergraduate research opportunities;
- connects students with on-campus research opportunities;
- connects students with off-campus/external research opportunities;
- offers advice on applying for and enhancing applications to undergraduate research opportunities (on-campus and off-campus);
- offers advice on finding travel funding and preparing research for presentation;
- connects students with opportunities to present their scholarly work; and
- connects student researchers with faculty research mentors.

For faculty, the Office of Undergraduate Research:

- connects faculty members with student researchers;
- aids faculty members in supporting undergraduate research activities;
- provides budgetary templates and language for inclusion of undergraduate researchers in proposals;
- aids faculty in writing proposals to support undergraduate research sites;
- offers on-campus programming for undergraduate researchers; and
- acts as a resource for undergraduate scholarly investigations across WVU.

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