



PROJECT REPORT

The Regenerative Bioscience Open House: A Promising Community-Engaged Outreach Initiative

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Abstract

This article presents a case study of the Regenerative Bioscience (RBIO) Open House, a community-engaged science outreach initiative designed to reach secondary students and science teachers. The project emerged in response to community-identified needs for greater exposure to advanced science topics, career awareness, and personal interaction with scientists. The event offered high school students and teachers an immersive introduction to regenerative bioscience, a field with broad implications for biomedicine. Students engaged with researchers, exploring cutting-edge therapies and biotechnologies through interactive programming. Teachers gained content knowledge, pedagogical resources, and hands-on experience to integrate into their curricula. The event also

served the regenerative bioscience community by enabling scientist-teacher collaboration and by facilitating student recruitment. Survey data revealed strong alignment with project goals and highlighted the reciprocal benefits of meaningful outreach. As a model of community-engaged scholarship, the RBIO Open House represents a promising approach to science engagement, workforce development, and academic-community partnership.

Introduction and Literature Review

Secondary science education plays a foundational role in shaping how students understand the world and envision their role within it. However, even the most thoughtfully designed curricula often cannot capture the depth, complexity, or interdisciplinary nature of contemporary

scientific fields. As a result, secondary students often lack exposure to advanced STEM fields and do not have a clear sense of how science evolves through experimentation, innovation, and collaboration, which can impact their interest in and preparedness for further scientific study (National Research Council, 2012; Nagle, 2013). These limitations can create an artificial distance between students and science, particularly for those whose schools lack the resources to supplement classroom instruction with experiential or research-based learning.

Regenerative bioscience is a multidisciplinary field that investigates the cellular and molecular mechanisms underlying tissue growth, repair, and replacement. Drawing upon tools from developmental biology and bioengineering, it explores the regenerative capacity of living systems and the potential to harness these processes for therapeutic use. A subset of this field, regenerative medicine, is focused on the clinical translation of regenerative bioscience approaches to restore or replace damaged tissues and organs. The term broadly encompasses cell and gene therapies (CGT), as well as tissue engineering, nanotherapies, and biomaterials (Yamada et al., 2021).

The field of regenerative bioscience represents both the promise and the inaccessibility of modern science. While technologies are advancing rapidly and moving from laboratory discoveries to clinical applications within a matter of years, public understanding remains limited, especially among youth (National Academies of Sciences, Engineering, and Medicine, 2017). Introducing students to this field in ways that are interactive and inclusive can help foster awareness, as well as a sense of possibility and belonging in science (Chen et al., 2016). This is also vital to developing the regenerative medicine workforce: it is imperative to train and support the burgeoning scientists and healthcare practitioners who will go on to innovate and administer these therapies (Hopewell et al., 2024).

To address these challenges, universities must take a more active role in bridging the gap between advanced scientific research and the communities they serve (Rollwagen-Bollens et al., 2022). Community-engaged science programming offers one avenue for doing so; by partnering with local educators, scientists and institutions can co-create learning experiences that are both rigorous and accessible. In the sections that follow, we outline key frameworks that guided the development of one such

initiative, the Regenerative Bioscience (RBIO) Open House, and situate it within the broader literature on science identity, educator partnerships, public engagement, and workforce development.

Youth Engagement and Science Identity

National data show that while many 10- to 14-year-old students enjoy science and recognize its societal value, relatively few aspire to become scientists. This disconnect between science interest and aspiration may stem from gaps in identity formation, access to mentorship, and early exposure to career pathways (Woods-Townsend et al., 2016). Stereotypical perceptions of science and scientists can adversely impact students' motivation, self-efficacy, and ability to envision themselves in science-related roles (Barry et al., 2023; González-Espada, 2007; Woods-Townsend et al., 2016). Student-scientist interactions can play a powerful role in closing these gaps by guiding adolescents to consider themselves capable of succeeding in scientific careers. Scientific educational outreach increases understanding of the sciences while fostering positive relationships between young people and scientists.

The American Association for the Advancement of Science (AAAS) emphasizes that all students should have access to high-quality science education, and that barriers such as age, gender, or cultural or socioeconomic background must not impede this goal (American Association for the Advancement of Science, 1990). Despite rapid advancements in biomedical research and biotechnology, high school students, particularly in rural or under-resourced school districts, often lack meaningful opportunities to engage with emerging scientific fields (Goldman, 2019; Means, 2019). Many students encounter barriers to participation long before college, including limited course offerings, few extracurricular science experiences, and little contact with practicing scientists. These barriers can impact students' knowledge and influence their self-belief.

Regenerative bioscience is emblematic of this barrier to access: as a highly interdisciplinary and rapidly evolving area of research, it is rarely included in high school curricula and remains inaccessible to most secondary students. Without intervention, this gap not only limits public understanding of science, but also narrows the future workforce pipeline. Programs that provide direct engagement with scientists can enhance students' interest

in science, demystify the scientific process, and support the development of a science identity (Barry et al., 2023; Kompella et al., 2020; Salonen et al., 2017). Research on science identity suggests that early exposure to scientific ideas, tools, and mentors is essential for fostering a sense of belonging in science and supporting long-term persistence in STEM pathways (Penuel et al., 2024; Vossen et al., 2023).

Supporting Science Educators as Community Partners

Teachers play a dual role in science outreach: as learners gaining exposure to current research and as educators translating that knowledge into pedagogical models of scientific practice (Houseal et al., 2014; Shanahan, M.-C., & Bechtel, R., 2020). They also act as influential connectors, guiding students toward post-secondary opportunities in science and healthcare. Yet, a persistent gap exists between those who teach science and those who practice it (Abramowitz et al., 2024; González-Espada, 2007). Scientist-teacher partnerships are crucial in bridging this divide: they augment teachers' pedagogical content knowledge and confidence, while drawing on the complementary strengths of both groups (Abramowitz et al., 2021; Houseal et al., 2014). Scientists contribute content expertise, while teachers offer instructional skill and deeper relationships with students (González-Espada, 2007).

Although secondary educators play a critical role in shaping students' experiences with science, they often face their own set of barriers when it comes to integrating new content areas into their teaching. As a parallel discipline to regenerative bioscience, biotechnology also represents a high-demand but underrepresented field within high school curricula, and secondary school teachers often feel underprepared and overwhelmed by the prospect of biotechnology instruction (Borgerding et al., 2013). Consequently, professional development in this area will be essential for teachers to keep pace with evolving educational paradigms and emerging technologies (Bates et al., 2022; Mihir Kumar Jena, 2024). Engaged outreach initiatives can enable teachers' professional development and provide the support they need to effectively guide their students.

Mutual Learning and the Role of University Scientists

Community engagement literature emphasizes that outreach should not be a one-way transfer of knowledge, but rather a reciprocal exchange in which all parties gain value (Clark et al., 2016; Reyes-Arriagada et al., 2021). These reflections align with a growing body of research advocating for public engagement as a form of professional development and pedagogical training for early-career scientists. Participation in such collaborations enables scientists, especially trainees, to hone their skills in communication, mentoring, and teaching, while serving as accessible role models for students (Abramowitz et al., 2021; Kompella et al., 2020). Explaining complex research to non-specialist audiences has been shown to measurably improve scientists' communication abilities and can positively shift attitudes toward the importance of outreach and public engagement (Clark et al., 2016; Kompella et al., 2020). Additionally, science communication skills are highly transferable across a vast array of science careers; thus, participating in educational outreach can serve as a valuable career development opportunity for scientists (Ritchie & McCartney, 2019). Beyond professional skill development, the personal benefits of community-engaged outreach are equally significant. Scientists who participate in public-facing outreach often report increased self-efficacy, a deeper sense of connection to their communities, and enhanced personal fulfillment (Abramowitz et al., 2021).

The Public Engagement Imperative and Workforce Readiness

Public engagement is essential to cultivating a scientifically literate society capable of making educated decisions about health and medicine. As biomedical technologies grow more complex, science communication must evolve to empower public understanding and support informed decision-making (National Academies of Sciences, Engineering, and Medicine, 2017). Equipping the public with this understanding as early as possible is an educational priority and an ethical imperative. Effective engagement also fosters trust between scientists and communities, promotes transparency in scientific practices, and enables scientific citizenship, particularly

among individuals historically excluded from traditional academic and clinical spaces (Ballard et al., 2023; Rufo, 2017). As regenerative therapies advance toward clinical application, individuals and families will increasingly face choices about cell-based treatments, gene therapies, and novel diagnostics. Higher education institutions, particularly those conducting cutting-edge biomedical research, have a responsibility to make this knowledge accessible (Regenberg & Schall, 2015). By engaging youth in regenerative bioscience, universities can help to cultivate an informed public, including future patients, caregivers, voters, and decision-makers. Even students who do not pursue science careers benefit from understanding technologies that may one day shape their lives or the lives of those they love.

The need for public engagement with science extends beyond educational equity; it is also central to workforce development. As of 2025, Georgia is home to more than 330 life sciences operations, employing over 36,000 professionals, as well as 500,000 healthcare practitioners and support workers—representing a 40% increase since 2010 (Georgia Power/Economic Development, 2026). The state ranks 14th nationally in bio-related occupational employment, and life science jobs are projected to grow 12% in the next decade, with continued expansion across sectors such as pharmaceuticals, diagnostics, and medical device manufacturing (Georgia Power/Economic Development, 2026). As regenerative medicine becomes more central to the biomedical economy in Georgia and beyond, the demand for a highly qualified workforce will continue to grow.

Although still a nascent field, regenerative medicine is rapidly developing on a national scale. As of May 2025, the U.S. FDA Office of Therapeutic Products has licensed 45 cellular and gene therapy CGT products—more than 1.6 times the total approved just two years prior—signaling a dramatic rise in demand. Unlike traditional biologics, such as monoclonal antibodies or vaccines, these “living therapies” require highly specialized biomanufacturing processes, analytical validation, and robust quality control strategies to ensure safety and potency. This complexity has contributed to persistent and growing workforce gaps across CGT manufacturing, quality control, and regulatory compliance (Fekete et al., 2023). Without targeted investment in workforce development, these gaps risk

delaying product development and limiting patient access to life-saving therapies (Hopewell et al., 2024).

While significant attention has been devoted to addressing the physician training gap in regenerative medicine (Schulman et al., 2015; Wyles et al., 2019; Wyles et al., 2021; Yamada et al., 2021), fewer efforts have been undertaken to embed foundational regenerative bioscience in secondary and undergraduate science curricula (Bajek & Drewa, 2011; Sandoval et al., 2022). Consequently, the next generation of scientists and physicians is largely unaware of the potential career opportunities in this field and the training necessary for employment, including technical skills in bioprocessing, cell and molecular biology, biomedical engineering, and regulatory sciences. The Alliance for Regenerative Medicine has called for the inclusion of regenerative medicine, including CGT content, in education and outreach programs at all levels to prepare future scientists, clinicians, and technicians for careers in this emerging dynamic discipline (Fekete et al., 2023). As regenerative bioscience emerges as a transformative field across biotechnology and medicine, there is a growing need to train a workforce with core competencies in the cellular and molecular tools that underpin these innovations.

Supporting scientific citizenship and career exploration through educational outreach reinforces the critical role of universities in preparing communities for a rapidly evolving healthcare landscape. This article presents a case study of the Regenerative Bioscience (RBIO) Open House, a pilot outreach initiative rooted in scientist-teacher partnership and developed to address intersecting needs in science access, identity development, and workforce preparation. By centering community needs, promoting mutual learning, and leveraging university resources, the project offers a replicable model for community-engaged educational outreach.

Institutional Context and Community-Identified Needs

Within a land-grant institution with a public mission to promote statewide access to higher education, workforce development, and public engagement with scholarship, the research center spearheading this RBIO Open House is a multidisciplinary hub for research and innovation in

cellular therapies, tissue engineering, and translational medicine. The RBIO community spans multiple departments and colleges, leveraging the expertise of over 40 scientists with diverse research interests. Through its collaborative research and training mission, the research center advances fundamental science while preparing future leaders in regenerative medicine and allied health professions. However, awareness of regenerative bioscience and the educational programs in this discipline remain limited.

In the fall of 2024, scientists in the center initiated a partnership with a biotechnology instructor at a regional career academy who also serves as the state coordinator for the Biotechnology Aptitude and Competency Exam (BACE). From the outset, the planning process was intentionally community-responsive: the event's structure, messaging, and activities were shaped by conversations with our partner to assess gaps in science engagement and develop a reciprocal outreach initiative, thereby ensuring alignment with community needs. This emphasis on co-creation and reciprocity reflects best practices in community engagement, which center mutual benefit and shared authority in the design and implementation of outreach. Through this collaboration, we identified several consistent needs among secondary students and science teachers:

1. Foundational awareness of regenerative bioscience as an emerging field in healthcare and biotechnology
2. Exposure to career pathways in regenerative bioscience
3. Opportunities to interact directly with scientists through both mentorship and hands-on learning.

These needs echo broader state and national concerns about equity in STEM education and access to life science careers, as biotechnology remains a growing but underrepresented pathway in high school curricula, and many teachers report limited professional development opportunities in this area. Meanwhile, the state's bioscience industry continues to expand, requiring a pipeline of future workers with the necessary skills. Outreach initiatives that bridge university research with secondary education are increasingly essential to fill these gaps and make advanced science more inclusive.

Centers like ours are uniquely positioned to help address these disparities, due both to the number of research scientists capable of teaching and mentoring students and to their wide range of expertise, which can be leveraged in collaboration with community leaders. Additionally, community-engaged programs that bridge university research and secondary education serve to foster public trust and investment in science, which is of particular importance to advancing the adoption of regenerative therapies. The RBIO Open House was developed in direct response to these needs, offering students and teachers an opportunity to interact with our research in a way that was approachable, interactive, and responsive to local interests.

Project Description

The RBIO Open House was developed as a full-day educational outreach event designed to introduce secondary students and teachers to the interdisciplinary field of regenerative bioscience. The event was held on Saturday, December 7, 2024. Registration was promoted statewide through direct outreach to secondary science teachers and administrators, existing university and community partner networks, school and professional-organization newsletters, social media, and word of mouth. Secondary students and science teachers were the primary intended audience, and they were welcome to attend with accompanying family members, including their parents, siblings, and children. The event was structured to reflect three core aims: to increase foundational awareness of regenerative bioscience, to expose participants to diverse career paths in biotechnology and biomedical research, and to create opportunities for students and teachers to engage directly with scientists in a welcoming, hands-on environment.

The design of the event reflected principles of community engagement, including co-development with a community leader, responsiveness to stakeholder feedback, and an emphasis on mutual benefit. The format was intended to balance informative presentations with interactive learning experiences that would appeal to a diverse audience. In alignment with the university's mission of public service and outreach, the RBIO Open House was framed as a pilot model for science engagement that

could be scaled or adapted by other departments and institutions.

The day was divided into two portions: a structured morning session focused on foundational learning and a more exploratory afternoon session featuring hands-on demonstrations. All attendees participated together in the morning program in a large lecture hall; the session began with an interactive game of Regenerative Bioscience Bingo, developed as a warm-up activity to introduce key concepts and terminology in a fun, accessible way. This activity was intended to scaffold understanding for the presentations that followed, including a brief program overview by the RBIO undergraduate coordinator and short introductions from faculty instructors. Near-peer mentors, current undergraduate students in the regenerative bioscience major, led a student Q&A session to share their own journeys and answer questions about college and the RBIO program.

Following a catered lunch, the afternoon featured an Exhibitor Fair hosted by 22 graduate students from 11 RBIO research laboratories, staggered along the teaching wing of the facility. Each exhibitor table was designed to provide hands-on or visual demonstrations related to ongoing research projects in regenerative bioscience, including cell culture, tissue engineering, and molecular diagnostics (Photoset 1). Guests moved through these stations at their own pace and could ask questions, explore lab materials, and learn more about the scientific process by connecting directly with the graduate student exhibitors. Concurrently, RBIO faculty and graduate students hosted a stem cell culture demonstration and guided activity in the facility's teaching laboratory, also located within the teaching wing, where guests learned about the principles of stem cell biology and basic cell handling practices. Guests who wished to participate signed up for one of two afternoon time slots for the laboratory activity. The goal of this portion of the event was to demystify laboratory research and promote a more inclusive vision of who can become a scientist.

Exhibitor Fair Tables Representing RBIO Laboratories

PHOTOSET 1.



The lab activities and demonstrations included: (A) regeneration of small worms called planaria, pictured in labeled dishes; (B) stem cells in embryos, using chicken eggs as a model; (C) brain cells and how they signal in both healthy and degenerative disease states; and (D) brain regeneration in cancer and acute injury using rodent brains.

The day concluded with the distribution of goodie bags containing gifts and educational materials for both students and teachers. Throughout the event, the RBIO Open House employed a variety of evidence-based teaching strategies, including game-based learning, near-peer mentoring, and experiential science engagement. Overall, the event was structured to promote reciprocal engagement between the university and local schools. Rather than delivering content in a traditional lecture format, the design emphasized active learning and open dialogue. While long-term outcomes have yet to be studied, the Open House was intended as an opportunity to build trust, spark curiosity, and lay the groundwork for future collaboration between the RBIO research community and Georgia educators.

Early Indications of Impact

To evaluate the Open House's efficacy in meeting its community-identified goals, we invited student and teacher attendees to complete a voluntary feedback survey. The

University of Georgia Human Research Protection Program (HRPP) Office reviewed the manuscript and the activities described herein and issued a Not Human Research Determination, declaring that the project did not constitute research involving human subjects as defined by DHHS and FDA regulations and that the activity fell within a regulatory exception for scholarly activities. Therefore, IRB review and approval were not required. Responses helped us to understand how participants engaged with the program and what areas might be improved in future iterations. Findings are organized below by stakeholder group, reflecting the event's multifaceted design and its alignment with the literature on science identity, workforce development, and engaged scholarship.

Student Engagement and Science Identity Development

The RBIO Open House was intentionally designed to reach students across the state of Georgia, ultimately drawing registrants from sixteen counties (Table 1). The geographic distribution of registrants and attendees reflects both the strength of our marketing efforts and areas for future growth. Urban and suburban counties were well represented; specifically, our outreach to nearby counties was effective, likely due to local advertising and the influence of our community partner. In contrast, participation from rural counties remained low despite registrations. Ultimately, only three rural guests attended the event (Table 1). This disparity underscores the broader challenges in connecting rural communities to higher education outreach and emerging STEM fields (Goldman, 2019; Means, 2019).

TABLE 1. Registrant and Attendee Distribution by County Type

COUNTY TYPE ¹	REGISTRANTS	ATTENDEES
Rural	8	3
Urban/Suburban	31	23
Total	39	26

¹ County designations are based on data provided by the State Office of Rural Health, within the Georgia Department of Community Health.

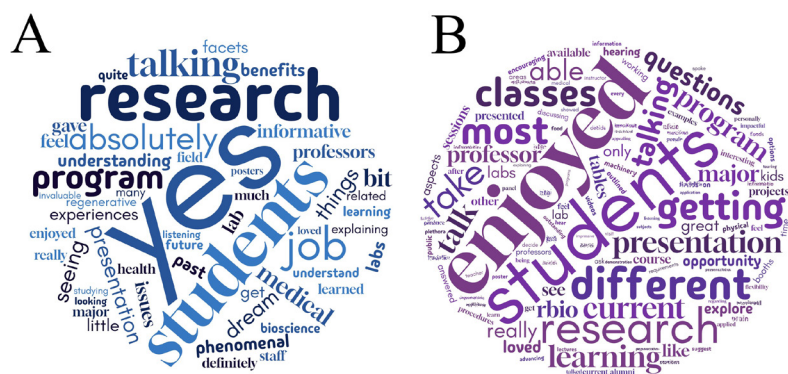
This table summarizes the geographic representation of the RBIO Open House, categorized by county type. Counties were classified as "rural" or "urban/suburban" based on the 2021 designations from the State Office of Rural Health and provided by the Georgia Department of Community Health. Although registration was open statewide, participation was highest among schools from urban and suburban counties, suggesting the need for targeted outreach and logistical support to improve access for rural regions.

Many student responses emphasized the value of interacting directly with scientists in an approachable and hands-on setting. The combination of guided activities, visual demonstrations, and casual Q&A with RBIO students and faculty contributed to an environment that encouraged curiosity and helped students feel more connected to their future in the field. One student attendee commented:

"I loved when the professors took the stage to talk about the subjects they teach, and also when we were able to visit different tables to take a closer look at research examples. The two parts were most memorable for me as it answered a lot of questions I had about the program, and allowed me to explore what I wanted to learn about."

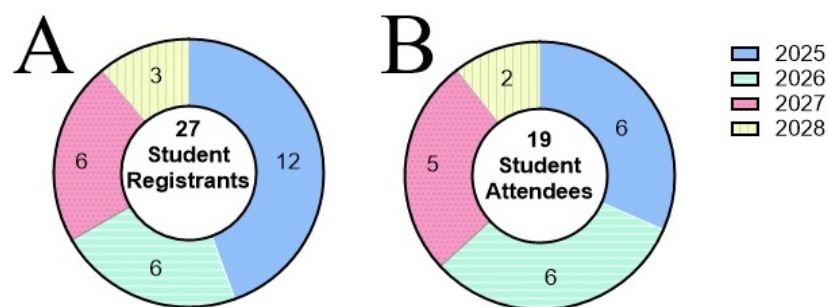
The event's impact was further reflected in qualitative responses to the feedback survey, completed voluntarily by 18 attendees. When asked whether the event supported their understanding of regenerative bioscience and the RBIO program, participants frequently used words related to learning, such as *studying*, *listening*, *understanding*, and *informative*, as well as aspirational terms like *dream*, *future*, and *job*. When describing what they found most enjoyable or impactful, attendees captured the essence of our student-centered approach, with *students* being the most frequent word to appear in their responses, followed by *research* and *classes* (Figure 1). Many remarked on the value of interacting with current RBIO students and faculty, and praised the hands-on, research-rich activities. These responses affirm the event's success in making regenerative bioscience and the broader work of the research center accessible, engaging, and relevant for our guests.

FIGURE 1. Word Clouds of the Long-Answer Responses Provided by Attendees



Eighteen answers were submitted in response to the questions (A) "Did our program support your understanding of and answer your questions about the field of regenerative bioscience and the RBIO program?" and (B) "What part(s) of our program for the day did you enjoy or find most impactful?", with larger font sizes in the word clouds indicating greater frequency in responses.

FIGURE 2. Graduation Year Distribution of Secondary Students



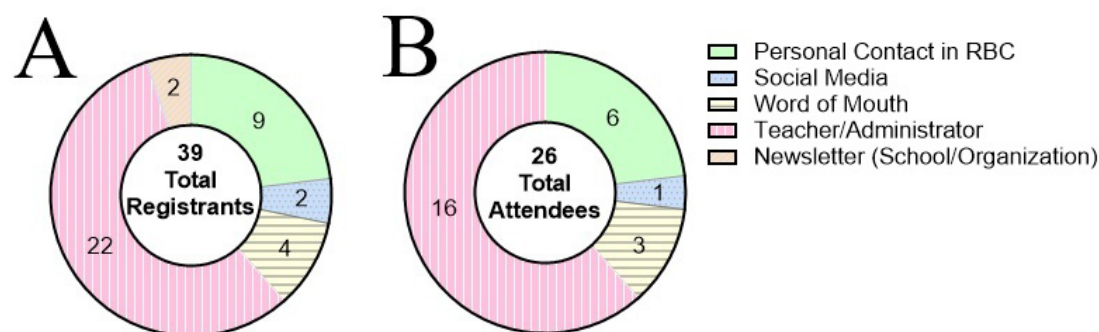
The distribution of (A) student *registrants* by graduation year, indicating a strong interest from upperclassmen, and (B) student *attendees*, showing the proportions of those who participated in the event

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Upperclassmen (classes of 2025 and 2026) constituted the majority of student attendees, likely reflecting their proximity to college decision-making. However, half of

registered seniors did not attend, suggesting that they may have already finalized their post-secondary plans and were less motivated to explore a new major (Figure 2). Engagement from younger students (classes of 2027 and 2028) signals a growing curiosity about regenerative bioscience and an opportunity to build early connections with future applicants. Although promotional materials, including flyers and social media posts, targeted high school juniors and seniors, participation across grade levels highlights the broad appeal of the Open House and its potential to reach both immediate and long-term audiences. These findings affirm the value

FIGURE 3. RBIO Open House Recruitment by Advertisement Approach



Avenues through which (A) registrants and (B) attendees learned of the event, highlighting the significant role of educators and direct connections in spreading awareness about the event

of hands-on, interactive outreach in shaping science interest and identity (Kompella et al., 2020).

Teacher Integration and Classroom Integration

Recognizing that science teachers often serve as key advisors to students exploring future careers, we were interested in understanding their role in distributing information about the event. Registrants and attendees indicated the avenues through which they learned about the RBIO Open House; educators and personal contacts emerged as the most influential sources, especially teachers, administrators, and direct outreach within the RBIO community network. While some individuals registered via more impersonal channels, including school and organizational newsletters, there were ultimately no attendees from these groups (Figure 3). It is likely that many students were encouraged or accompanied by their science teachers, which may have increased their comfort in what might otherwise have been an intimidating setting. These patterns underscore the value of cultivating scientist-teacher partnerships to expand awareness and participation in outreach efforts.

The scientist-teacher partnership between the research center and our community collaborator, a secondary education and workforce development specialist, exemplifies the power of co-creation in academic-community engagement. This relationship informed both the content and format of the Open House and supported an alignment with real classroom needs. Based on his

guidance, we determined that a central goal of the event would be to equip educators with tools and resources to integrate regenerative bioscience content into their curricula. This included specialized goodie bags containing additional materials, resources, and contact information, which were identified as high-priority by our community partner. Teachers expressed appreciation for the opportunity to connect with university researchers and explore new content areas for their classrooms. Several reported that the event helped them better understand regenerative bioscience and how to communicate its relevance to students. Feedback from teachers also highlighted areas for future collaboration and sustained scientist-teacher partnerships. Many requested follow-up opportunities such as field trips, virtual guest lectures, or virtual curriculum modules. One secondary educator wrote:

"If it is possible, I would like to have a speaker come and talk about your program, but also your research topics. I teach AP Environmental Science and Honors Biology at [redacted] High School and would love to have the opportunity for our students to see what research is possible and what they could major in. With the discussion about genetic research and cell therapies, this is right in line with our biology classes and will be the perfect presentation. I honestly would love for all biology classes to have the option to have you come and speak to them."

Scientist Participation and Mutual Benefit

Research has shown that programs grounded in scientist-teacher partnerships generate positive outcomes for all participants and address a well-documented need for greater public engagement with science (Abramowitz et al., 2021; Clark et al., 2016). At the RBIO Open House, 22 graduate students and 10 faculty members participated in the Exhibitor Fair and hands-on activities; while not formally requested or recorded, their unsolicited perceptions of the event were overwhelmingly positive, aligning with existing research on the benefits of scientist engagement in community-centered programming. Many noted that this was a worthwhile experience which helped them articulate their research more clearly and build confidence in engaging with non-specialist audiences. One exhibitor shared that it was their first time explaining their work to families and that the challenge of doing so was both energizing and rewarding. This mutual benefit of providing professional development for university scientists while supporting public engagement is a key principle of community-engaged scholarship. While not formally assessed in this pilot event, the enthusiasm and reflections shared by presenters suggest that future iterations of the RBIO Open House could incorporate more intentional evaluation of student-scientist outcomes.

Lessons Learned and Feedback to Action

The RBIO Open House was designed to inspire the next generation of scientists and healthcare professionals while raising awareness about the transformative potential of regenerative bioscience. By engaging both students and educators, the event sought to demystify advanced scientific concepts, introduce career pathways, and support workforce development in this emerging field. Our analysis of event data and participant feedback surfaced several key lessons, which will guide the construction of future events and may be valuable to other institutions seeking to replicate this work.

Lessons Learned

1. Strong community partnerships drive success.

Collaborating with a workforce development specialist in secondary education ensured that the event addressed

authentic community-identified needs and that our event format and content were relevant and accessible. This partnership informed the structure of the day, helped to craft teacher-specific materials, and extended our outreach through established educator networks. However, we also recognize that the community-identified needs we set out to meet were broadly articulated; the needs of pre-college students and science teachers in Georgia are diverse and may evolve or expand just as our scientist-teacher partnerships do.

2. Reaching rural communities requires deeper investment.

While the event reached registrants from 16 counties, it drew attendees from only 11 counties, and rural communities were underrepresented (Table 1). Most attendees came from counties with direct ties to our community partner, illustrating the importance of relationship-driven outreach. To address this, we plan to pursue earlier and deeper engagement with educators, administrators, and community-based organizations in rural school systems. Additional options to improve access, including transportation assistance and developing a parallel virtual experience, will also be explored.

3. Personal connections outperform mass marketing, but recruitment efforts must minimize gatekeeping.

Our analysis showed that most attendees learned about the event through teachers or personal recommendations. By contrast, promotion through newsletters and social media yielded little measurable engagement (Figure 3). This pattern reveals an important limitation. Because the event was advertised primarily to students interested in science or health, and since participation was voluntary, attendees likely represented a self-selected group with at least some pre-existing interest in STEM. Reliance on teacher-mediated outreach may also unintentionally narrow access if opportunities primarily reach students who are already recognized as "science students." Informal STEM scholarship cautions that educator practices can shape who gains access to and feels welcome in enrichment spaces, and established biomedical outreach programs have addressed this concern by recruiting students based on who may benefit from exposure rather than on prior achievement or an established commitment to science (Greenberg et al., 2025; Witzel et al., 2020). Future recruitment will

therefore preserve strong educator partnerships while broadening outreach through school counselors, public libraries, youth organizations, rural community partners, and messaging that explicitly welcomes students who are curious about science but do not yet strongly identify with it.

4. Future assessment should include scientist outcomes.

For graduate student exhibitors and undergraduate near-peer mentors, the event served as an opportunity to build science communication and mentoring skills in a real-world setting. Intentionally designing space for mutual learning, and providing more preparatory training in future iterations, can increase the professional development value for university participants. While the evaluation of the first RBIO Open House focused on participant feedback and demographics, future assessment efforts will also include surveying graduate and undergraduate student volunteers and faculty about their experience of the event. Given the documented benefits of community-engaged scholarship for scientists, we would like to better understand how the Open House influenced trainees via validated evaluation strategies.

Feedback to Action

Survey responses from attendees emphasized the value of personal interactions with scientists and hands-on experiences with regenerative bioscience tools and topics (Figure 1). Our guests expressed a desire for more opportunities to engage deeply with the center's research and training mission. Future iterations of the RBIO Open House will incorporate community feedback aimed at enhancing this impact.

1. Breakout sessions

Our community partner remarked that secondary science teachers would benefit from more guidance and support in incorporating RBIO content in their own classrooms. While this first iteration of the Open House may have provided inspiration, our future events will include more deliberate coaching, which will enable these science teachers to better teach RBIO concepts. Similarly, feedback from secondary student attendees reflected an appreciation for interactions with current university students,

with several participants indicating that speaking with RBIO undergraduates was the most impactful part of the day, and that they would have liked to hear more student stories. Smaller, dedicated breakout sessions will allow for more tailored engagement; while secondary science teachers co-develop lesson plans with RBIO instructors, high school students will benefit from additional near-peer mentoring by current RBIO undergraduates, and more focused time to ask questions about college, research, and the student experience.

2. Guided laboratory tours

Interactive activities like Regenerative Bioscience Bingo and lab demonstrations were consistently cited as highlights, as these hands-on elements not only supported knowledge retention but also fostered excitement and confidence among students. Many participants asked about touring the center's facilities, and while we were not able to invite visitors into the laboratories during our first RBIO Open House due to scheduled building maintenance, we intend to do so in the future to further encourage these feelings of enthusiasm. Graduate students will lead staggered small group tours of select laboratories, offering guests a closer look at the scientific environment and active research underway. We will station current undergraduate research assistants in each of the labs to greet guests, answer questions about their experiences conducting research, and demonstrate some of their ongoing work.

3. Expanded research displays

One feedback survey response specifically commented on the benefits of seeing what a poster presentation should look like. Although only a few of the tables featured a poster in their displays, the event space could be made more functional by taking advantage of unused wall space to support learning. For future Open House events, graduate students from each lab will bring their own research posters to line the hallways. This would pair well with the guided lab tours, as the posters would serve as a precursor to the research overviews.

Conclusion

The RBIO Open House was developed in response to community-identified needs and grounded in principles of community-engaged outreach. The event set out to make advanced science accessible, to support local educators, and to inspire students from all backgrounds to see themselves in scientific roles. While the program was modest in scope, it serves as a meaningful example of how university-led outreach can be designed not only to inform, but also to deeply engage future scientists in active learning processes. The RBIO Open House will continue to evolve based on our target community needs, and future iterations will incorporate structured evaluation tools in order for all stakeholder groups to better assess the reciprocal impacts of participation. This project contributes to ongoing conversations about the role of higher education in preparing a scientifically literate, workforce-ready public. As institutions seek to expand their community engagement efforts, especially in the sciences, it is critical to adopt approaches that are responsive and relationship-driven. The essence of co-creation and mutual benefit that guided the planning of the RBIO Open House offers a replicable foundation for such work. The combination of these elements will prepare students, support educators, and strengthen the regenerative bioscience workforce pipeline in Georgia and beyond.

About the Authors



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