AACP REPORTS

The Report of the 2021-2022 AACP Research and Graduate Affairs Committee

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EXECUTIVE SUMMARY. The work of the 2021-2022 AACP Research and Graduate Affairs Committee (RGAC) focused on barriers to graduate education and research-related careers in pharmacy education. AACP President Stuart Haines charged the RGAC with identifying the critical barriers that hinder current PharmD students/recent graduates as well as under-represented groups (e.g., Black and Latino) from pursuing advanced degrees and research-related career paths in the pharmaceutical, social & behavioral, and clinical sciences and recommending changes that might address these barriers — this may include recommendations to change the fundamental structure of graduate education.

The committee began its work with a literature review to survey current perspectives on these barriers and assess the supporting evidence for effective solutions and programs, including their relevance to pharmacy education. Based on the review, the committee was able to identify numerous obstacles to entry into and progression through research training, for both underrepresented learners and student pharmacists. Obstacles are individual, e.g., lack of exposure to and self-efficacy in research, financial constraints, structural, e.g., lengthy training time, programmatic rigidity, and institutional, e.g., implicit and explicit bias. The committee found evidence of effective approaches and programs to address these barriers that could be applied in pharmacy schools. These approaches include improvements to existing practices in recruitment, admissions and hiring practices as well as creation of new programs and structural changes to existing programs to increase accessibility to learners. The committee also recognized a need for more research and development of additional approaches to address these barriers.

The committee makes a series of recommendations that AACP develop resource guides and programs to address key issues in the recruitment and retention of underrepresented students and student pharmacists into graduate education and research careers, including as faculty. The committee also proposes new AACP policies to support innovative graduate programs and early, longitudinal engagement of learners from elementary school onward to increase access to graduate education and to support environments and cultures of commitment to accessibility, diversity, equity, inclusiveness, antiracism in pharmacy education.

Keywords: Adult Learning, Career Paths, Diversity, Faculty Recruitment, Graduate education, Recruitment, Research

INTRODUCTION AND COMMITTEE CHARGES

The American Association of Colleges of Pharmacy (AACP) Research and Graduate Affairs Committee (RGAC or the Committee) assists with the development of AACP’s research, graduate education, and scholarship agenda with a
membership that represents the different research disciplines of pharmacy education. The RGAC is frequently called on to provide insights and recommendations related to the ongoing development of and continuous support for a diverse and representative community of researchers and trainees across pharmacy education.

AACP President Stuart Haines charged the 2021-2022 RGAC to:

1. Identify the critical barriers that hinder current PharmD students/recent graduates as well as under-represented groups (e.g., Black and Latino) from pursuing advanced degrees and research-related career paths in the pharmaceutical, social & behavioral, and clinical sciences.
2. Recommend changes that might address these barriers — this may include recommendations to change the fundamental structure of graduate education.
3. In addition, the RGAC was charged, along with other AACP Standing Committees, to nominate at least one person for an elected AACP or Council Office and consider ways that AACP can improve its financial health.

The committee convened for a one-day hybrid meeting on September 29, 2021 with some RGAC members present in-person and some connecting through Zoom. The committee also met virtually every other week from August 2021 through April 2022. President Haines met the committee in-person at the September 29 meeting to provide guidance on addressing the 2021-2022 charges. AACP staff liaisons for each standing committee met monthly throughout the year to share updates on committee work and identify opportunities for joint action and coordination between committees.

BACKGROUND

Through discussion with President Haines, the committee clarified that the goal of its major charge is diversification of the pharmacy faculty pool with a recognition that a more diverse graduate student population is a necessary precondition to attaining that goal. This is particularly needed for the STEM (Science, Technology, Engineering and Mathematics) faculty pipeline, which is not representative of the U.S. population demographics. For example, only 7.7% of full-time scientists are Black, compared to 13% of the U.S. population. An opportunity to recruit graduate students is present among the existing PharmD population, including working pharmacists, which is more diverse than the STEM workforce. According to the AACP Fall 2020 Profile of Pharmacy Students, 15.7% of PharmD degrees were awarded to underrepresented students (8.8% Black or African American, 6.4% Hispanic or Latino, 0.2% Native Hawaiian or Other Pacific Islander, 0.3% American Indian or Alaska Native.) These pharmacy graduates could be recruited into research and graduate education pathways for faculty roles.

President Haines encouraged the committee to consider structural barriers to increasing diversity, including standard graduate program structures that are not conducive to non-traditional trajectories and unsupportive of returning learners. These structures have disproportionate impact on underrepresented learners and working professionals. At the same time, dissemination of resources to address practical obstacles to graduate education in pharmacy is needed, such as improved messaging to both learners and faculty about sources of support for graduate students.

Charged with identifying and recommending changes to address critical barriers hindering PharmD graduates and underrepresented students from pursuing graduate education and research-related career paths, the committee decided on a literature review to survey current perspectives on these barriers and assess the supporting evidence for common perspectives and programs proposed to address these barriers. Given the two distinct learner populations the committee was charged with considering – all pharmacy (PharmD) students and graduates and underrepresented students in any discipline within pharmacy or biomedical sciences education, the committee developed search terms for each learner population and performed separate searches and analyses for the two sets of search terms (Table 1). AACP staff liaisons performed the literature search and exported results into citation libraries for committee members to review.

The committee discussed alternative information sources that could be used to garner insights into challenges associated with bringing learners into graduate education and research pathways. The gray literature of association and governmental reports and proceedings was consulted for summary findings relevant to the committee charges.

Literature Search

AACP staff liaisons performed Google Scholar searches in August 2021 for journals articles published between 2010 and 2021. Books, websites, news items, and brochures were excluded from search results, as were journal articles focusing on education and training outside the United States or Canada. AACP staff removed articles that, from the title, focused on pharmaceutical research or on the pharmacy profession beyond education/training/careers related to research. The remaining articles comprised...
a library of more than 700 articles – 156 articles with a focus on diversity, equity, inclusiveness, and antiracism (DEIA) in STEM and 583 articles focused on research pathways for PharmD students and graduates.

Gaps exist in the pharmacy education literature, with very few articles focused on specific research disciplines within pharmacy education or preparation for pharmacy research careers, beyond reports of capstone or honors research courses for student pharmacists. Regarding research careers for underrepresented learners, the committee relied on the broader literature on improving representation and enhancing diversity in the biomedical research workforce and extrapolated results to pharmacy disciplines. For clinician or practitioner research, the literature almost exclusively focused on physicians and physician-scientists. Given the significant differences in the structured training and available resources for research support between pharmacy and medicine, extrapolation from these sources is more challenging. It was also noted that much of the literature focuses on research training in the context of PhD and post-doctoral training programs, despite the emergence of master’s level dual degree programs in recent years and their importance in social, behavior, administrative, and policy research. Finally, original research on effective strategies to increase representation of either health professionals or underrepresented groups in the research workforce was less common than perspective pieces, reports, or similar article types. Although the committee relied primarily on research articles in its analysis, perspective and opinion pieces were consulted as understanding the lived experience of learners and faculty is essential to developing effective solutions.

To analyze the search results, the committee developed a rubric for assessing each article (see Appendix). The rubric allowed categorization of articles by major focus, i.e., research pathways for pharmacists or for underrepresented learners, and tagging with common topics observed in the literature results, i.e., recruitment, enrollment management, student motivation, research experience, and financial burden. Each committee member was assigned approximately 90 articles to review and discard if irrelevant or upload to a citation list if relevant to the committee charges, including categories and filters from the rubric, information about the barrier to research and graduate education addressed in the article or solutions proposed, and additional notes.

Discussion of the barriers identified through the literature review and prioritization of potential solutions was the main work of the meeting on September 29, 2021. The committee prioritized a list of fourteen barriers grouped into three general categories to focus on in the remainder of the committee work: 1) barriers related to individual learner motivation and access to graduate education, 2) barriers related to structural shortcomings in graduate programs and schools, and 3) barriers related to institutional and environmental hostilities towards underrepresented learners and faculty. The committee identified implicit and explicit bias as a cross-cutting issue at play in these sets of prioritized barriers through continued analysis of the literature and articulation of potential solutions. The committee’s recommendations, suggestions, and policy statements resulting from these analyses are given below.

RECOMMENDATION 1: AACP should create a resource guide of best practices for recruitment and retention of students into research pathways.

Long term improvement in the diversity of pharmacy faculty will require sustained effort to enhance the diversity of the faculty development pipeline. The literature search revealed numerous programs, many of them cohort-based, with evidence of success in strengthening underrepresented learners’ persistence across the STEM workforce pipeline. One compelling theme that emerged from this literature was the importance of maintaining structured programs and evidence-based approaches to
Table 2. Suggested topics and materials for inclusion in AACP resource guides for recruitment and retention of a) students and b) underrepresented faculty. These tables are intended to provide a starting point for development of resource guides, not an exhaustive list of appropriate content.

<table>
<thead>
<tr>
<th>a) Resource Guide for Student Recruitment and Retention</th>
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<tbody>
<tr>
<td>Structured programs to enhance recruitment to graduate education</td>
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<td>Evidence-based approaches for student recruitment</td>
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<td>Inclusive marketing and recruitment materials</td>
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<td>Holistic admissions</td>
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<td>Data-driven enrollment management</td>
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<td>Collaborative recruitment models</td>
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<td>Data standards and benchmarks (e.g., for demographics, stipend levels, benefits, tuition remission)</td>
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<td>Metrics and assessment tools for recruitment and retention initiatives</td>
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<td>Mentoring</td>
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<td>Professional development and competency-based learning</td>
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<td>Alternative program structures (e.g., distance and part-time learning)</td>
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<td>Family friendly policies and processes</td>
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<td>Flexible and adaptive program structures</td>
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<th>b) Resource Guide for Underrepresented Faculty Recruitment and Retention</th>
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<tbody>
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<td>Metrics and assessment tools for recruitment and retention initiatives</td>
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<tr>
<td>Data standards and benchmarks</td>
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<tr>
<td>Mentoring</td>
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<tr>
<td>Metrics and rubrics for equitable reappointment, promotion and tenure</td>
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<tr>
<td>Financial barriers to academic careers</td>
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<tr>
<td>Collaborative models of faculty support networks</td>
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<td>Faculty isolation</td>
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<td>Family friendly policies and processes</td>
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<tr>
<td>Explicit and implicit racism in academic settings</td>
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<td>Inclusive evaluation of research, practice and service activities</td>
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students to make fully informed choices related to graduate education and research careers, including suggesting changes to AACP’s student surveys, if appropriate. Both schools and learners will benefit from inclusion in the resource guide of best practices or benchmarks for what competitive stipends need to be to successfully recruit graduate students and post-graduate learners from various backgrounds. AACP should assist with gathering and curating data for such benchmarking.

The resource guide should provide information and recommendations for more comprehensive reforms related to recruitment and retention. The guide should offer
recommendations on diverse and novel sources for student recruitment, such as national associations, meetings, and programs that convene underrepresented learner populations interested in STEM and health professions disciplines. The guide should include information on emerging disciplines with relevance to research disciplines in pharmacy education. Interdisciplinary graduate education and research programs in the biomedical sciences are increasingly common as they bring together scientists from multiple backgrounds to address complex research questions. Active pharmacy faculty participation in these programs not only stimulates research collaboration, but it also allows pharmacy faculty access to potential graduate students in STEM undergraduate majors and majors relevant to the social, behavioral, and economic sciences. New mechanisms for recruitment should also be addressed in the guide, including advances in virtual and collaborative recruitment programs and data-driven methods in enrollment management. Significant resources dedicated to high quality mentoring exist, and the guide should provide guidance on those resources most useful and relevant for pharmacy education.

The resource guide should help pharmacy schools establish collaborations among schools to enable recruitment from pharmacy programs; this could be particularly valuable for increasing access to graduate education for students from professional program-focused pharmacy schools and programs that primarily serve underrepresented students. AACP and the resource guide should include information on external organizations and funders that may support such collaborations.

For recruitment of student pharmacists into research pathways, the resource guide should address ways to provide early exposure to research within the pharmacy curriculum and introduce roles in pharmacy and career paths that may require advanced degrees, thus allowing students to adequately prepare for entry into appropriate degree programs. Introduction of these roles and paths to students as early as during recruitment to pharmacy school should be considered. Practices to improve communication and collaboration between recruitment efforts for both professional and graduate programs should be included in the resource guide.

Some of the barriers restricting access to graduate education cannot be addressed by improved recruitment efforts. Structural factors and individual preferences and circumstances weigh heavily in the decision to pursue graduate education. For pharmacists, practice interests and conflicting clinician/researcher identities can lead potential students away from graduate education. Most students enter pharmacy school with the intention of providing patient care and considering a research career may have never been considered. Introducing concepts such as the ‘scientific clinician’, ‘scholar clinician’, and ‘clinical scientist’ early in pharmacy education may increase awareness and help inculcate an interest in research and scholarship. The creation of nontraditional programs that enable pharmacists to expand but not replace their professional identity as health professionals is needed. Programs may require different formats and time periods, such as part-time and distance learning options, to accommodate concerns over cost, time, and commitment. Greater integration of clinician and researcher identities may require rethinking course requirements, research settings, and rules regarding outside employment to enable working professionals to continue their education.

The costs of graduate education in time and money are significant, and they coincide with worries over debt from undergraduate or professional education, the uncertainty of job opportunities, and family obligations to inhibit choices related to advanced training. This may be particularly true among underrepresented students. To increase equity and access in pharmacy research education, it is important that the resource guide address structures for educational programs that have the flexibility and adaptability to meet learners’ individual circumstances. Appropriate resources and infrastructure must be put in place if these are going to be successful and sustainable.

Given the need for new graduate research program structure and philosophy, and consistent with AACP’s established support for innovative graduate programs that prepare trainees to excel in careers across the pharmaceutical and biomedical sciences as well as in pharmacy and healthcare, the committee proposes one new policy and one policy amendment related to graduate program structures.

**POLICY STATEMENT 1:** AACP supports the development of non-traditional, innovative postgraduate research training programs in order to decrease barriers to entry, retention, and completion. [Adopted by the 2022 AACP House of Delegates]

**PROPOSED POLICY AMENDMENT:** AACP will work with the colleges and schools of pharmacy to promote innovation and excellence in graduate education and research programs to provide graduate students and postdoctoral trainees with professional development skills, career guidance, and mentoring that best prepares them for success in a wide array of opportunities in the workforce. ([Original Source: Research and Graduate Affairs Committee, 2016. Revision approved by 2022 AACP House of Delegates]

**RECOMMENDATION 2:** AACP should offer formal training programs (e.g., institutes, premeeting symposia) to prepare faculty to mentor underrepresented students, including preparation for research careers.
Positive exposure to research for underrepresented students is associated with pursuing research-related careers, including academia. In addition, quality mentoring contributes to identity formation as a scientist for underrepresented students and enhances their entry into and retention in graduate programs. Mentoring is a crucial element of programs targeting learners at all levels, from middle-school students to faculty.

The value of mentoring is tied closely to the quality of mentoring, and there is a persistent need for “train the trainer” programs to improve faculty mentoring skills. AACP should develop and deliver programs on mentor training within pharmacy education, as well as include best practices for mentoring and mentor training within the student recruitment and retention resources guide. AACP could prepare one-two day intensive mentorship training to deliver in conjunction with the annual AACP meeting, similar to the existing Admissions Workshop and Teachers Seminar. AACP should also investigate longitudinal models for mentorship training that extend the intensive, in-person program with regular virtual check-ins. Such a program could create cohorts of trained mentors to act as a peer network for participants and provide mentee training, an important but often overlooked feature of successful mentoring programs.

Peer networks may be particularly valuable for underrepresented faculty, providing a source of support through the promotion and tenure process and a counter-weight to the potential isolation of academic life.

An important goal of AACP mentorship training should be to prepare all pharmacy faculty and develop skills to optimally mentor underrepresented students and faculty. This is important to avoid disproportionate burden on faculty and staff from underrepresented backgrounds. Mentoring training programs should be behaviorally focused, and they should focus on mentoring individuals interested in research careers, as well as teaching, practice, and professional development. In preparing programs and resources related to mentoring, AACP should build on and leverage existing resources, such as those from the National Research Mentoring Network (NRMN, https://nrmnet.net/) and the Associated Colleges of the Midwest’s Undergraduate and Faculty Fellows Program for a Diverse Professorate (https://acm.edu/faculty/career-teaching/undergraduate-and-faculty-fellows-program-for-a-diverse-professorate/)

**POLICY STATEMENT 2:** AACP endorses early, longitudinal engagement in research through structured programs to stimulate interest in research careers among middle school, high school, and undergraduate students. [Adopted by 2022 AACP House of Delegates]

The barriers hindering the entry of underrepresented students into graduate education and research pathways are in many cases present in these students’ lives from their earliest educational experiences. A lack of social support and mentorship and poor preparation at the middle and high school levels negatively affect these students’ ability to enter and thrive in STEM programs at the undergraduate level. These early experiences lead to low self-efficacy and negative career outcome expectations that suppress interest in STEM fields among underrepresented students. As with learners at higher educational levels discussed previously, evidence-based programs focusing on younger learners show signs of success in promoting student entry into STEM and research careers, but awareness of these programs and access to them lags. This lack of awareness is an issue for both students who could benefit from participating in these programs and for undergraduate and graduate programs that could deliver such programs as part of long-term recruitment programs. AACP supports awareness-building and engagement with students and parents from middle school onwards to support interest and entry into Doctor of Pharmacy programs and undergraduate programs in the pharmaceutical sciences as a means to develop their potential interest in graduate research careers.

AACP should work with pharmacy schools and other stakeholders to increase outreach to early-stage learners with the goal of creating a more diverse pipeline for the research workforce in all pharmacy education disciplines. Support for this pipeline should extend through undergraduate education and would benefit from collaborative recruitment programs discussed above. AACP should also work with member schools to develop best practices to address challenges that arise from engaging younger learners in research. These should include good safety and training practices, advice on navigating policies and regulations regarding minors in the lab, and policies and procedures to assure student safety and well-being, including mandatory training and reporting requirements under state and federal law, including the Clery Act. (Code of Federal Regulations, Title 34, last amended 3/1/2022. https://www.ecfr.gov/current/title-34/subtitle-B/chapter-VI/part-668/subpart-D/section-668.46)

**RECOMMENDATION 3:** AACP should create a resource guide of best practices for recruitment and retention of underrepresented faculty.

Interventions designed to increase diversity succeed best when structured and evidence-based programs are initiated, whether it be faculty-focused programs or student programs, and AACP is well-positioned to collect and disseminate best practices for recruitment and retention of underrepresented faculty. Numerous programs to enhance faculty diversity or to support underrepresented faculty have been documented, although a lack of data on
intentions and outcomes for researchers across the training cycle is a challenge.\textsuperscript{26} AACP can help disseminate knowledge of best practices and support collection of data for continual improvement through creation and maintenance of a resource guide (Table 2b). The inclusion of academic career training and mentoring efforts to promote retention and progression of learners should be a shared feature of the resource guides.\textsuperscript{11}

Successful programs require the use of clear and appropriate metrics and assessment tools. The resource guide should include information about the development and use of appropriate rubrics for evaluation of institutional programs and policies related to DEIA goals, including faculty recruitment and retention, and for college assessment plans. Guidance should be provided on best practices for individual assessments and rubrics that include appropriate consideration for different faculty positions and are designed so that policies on reappointment, promotion and tenure and their implementation contribute to larger goals related to DEIA, rather than creating additional barriers for underrepresented faculty. Faculty assessments should recognize the value of contributions to DEIA efforts in teaching, service, practice and research and the different levels of service and research interests of faculty from different backgrounds. Faculty are hired for different roles, and they should be evaluated based upon what they were hired to do. AACP should work with its member institutions on the development and evaluation of appropriate metrics and minimum standards for recruitment and retention outcomes.

An AACP resource guide for recruitment and retention of underrepresented faculty should address many of the challenges discussed for the student resource guide, such as recognizing the time and financial constraints that limit entry into academic careers and the low self-efficacy and sense of isolation that challenges underrepresented researchers seeking to persist in research careers.\textsuperscript{26} Collaborative models should be considered for programs and activities that can support retention and progression of underrepresented faculty by building support structures and social networks.

It is important that the guide address implicit and explicit racism in academic settings, recognizing the toll these take on faculty and students and the necessity of institutional environments that provide safe settings for teaching learning, research and scholarship, service, and patient care, as well as supporting the varying needs of diverse communities.\textsuperscript{27} The philosophy of DEIA should be integrated into all college activities to meet the needs of learners and prepare a culturally competent healthcare and biomedical research workforce.\textsuperscript{28–30} This should include a clear articulation of the underlying rationale for a culture of DEIA within pharmacy education, pointing to the literature on the negative effects that bias and racism have on faculty recruitment, morale, and retention. Religious educational institutions, in which the entirety of the educational enterprise is informed by the ethical and philosophical underpinnings of the institution’s faith tradition, provide a powerful model for how institutions can make their ethical commitments to DEIA inform and strengthen their educational, research and service missions.

AACP should work with its members schools on effective DEIA programs and practices, recognizing that organizational change requires time and patience, but that consistent efforts at capacity building will lead to improved retention and progression for students and faculty.\textsuperscript{30,31} As with mentoring, it is crucial that support for DEIA is recognized as a shared responsibility and that a disproportionate burden for DEIA is not placed on underrepresented faculty, staff, leaders and students. The “minority tax” placed on underrepresented faculty that can distract them from meeting their teaching, research and service-related goals and negatively impact their career progression must be recognized, and action taken to counteract it.\textsuperscript{32–34} There remains a need to go beyond descriptive research and conduct work that seeks to improve and overcome these biases and inequities. Leveraging the field of implementation science, this work should seek to measure the outcomes of such interventions so that other institutions can implement high-quality and effective interventions.

**PROPOSED POLICY STATEMENT 3:** AACP supports recognition of education, service, and research activities related to cultural humility, accessibility, diversity, equity, inclusion, and antiracism for faculty evaluation, reappointment, promotion, and tenure. [Adopted by 2022 AACP House of Delegates]

**PROPOSED POLICY STATEMENT 4:** AACP encourages institutions to commit to creating and sustaining environments that support accessibility, diversity, equity, inclusion, antiracism, and anti-bias action and awareness among all faculty, staff, leaders, and students. [Adopted by 2022 AACP House of Delegates]

**RECOMMENDATION 4:** AACP should create an academic development program for graduate students and research fellows who are interested in faculty careers, with an intention to increase diversity among pharmacy faculty.

Given AACP’s longstanding experience in and success with faculty development within pharmacy education, and the evidence that structured programs contribute to persistence and progression of underrepresented learners into research careers,\textsuperscript{22,35} AACP should create an academic development program that supports learners’
progress into academic careers. This program should have a primary goal of increasing diversity among pharmacy faculty, although greater recruitment of student pharmacists into academic research should be encouraged as well. A successful program will be longitudinal and cohort-based, with cohorts providing social and peer support to counteract the isolation reported by underrepresented faculty and post-graduate trainees. Although the program should be cohort-based, it should not be cohort limited, and AACP should aim to create and sustain a larger community around the program, where earlier cohorts can serve as mentors and role models for later cohorts. AACP should work with schools, including through information in the resource guides, to encourage openness to new models of hiring that may incorporate participation in structured development programs for early-stage faculty.

CONCLUSION

The 2021-2022 AACP RGAC identified numerous barriers for entry into graduate education and research careers for pharmacists and underrepresented students, and additional barriers to retention and progression of underrepresented faculty. Evidence-based approaches to overcoming these barriers exist, but more research is needed to develop additional structured approaches and improve translation of successful programs to the pharmaceutical sciences broadly. The committee makes several recommendations and policy statements for AACP to take up to increase access to graduate and research pathways.

POLICY STATEMENTS AND AMENDMENT

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REFERENCES

6. Foroozesh M, Giguette M, Morgan K, et al. Building integrated pathways to independence for diverse biomedical researchers: Project Pathways, the BUILD program at Xavier University of
American Journal of Pharmaceutical Education 2023; 87 (1) Article 9454.

## Appendix 1. Article Citation Table for Literature Review

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