AACP REPORTS

Report of the 2014-2016 AACP Research and Graduate Affairs Committee

Natalie D. Eddington (Chair),[a] Jeffrey Aubé,[b] Sudip K. Das,[c] Vicki L. Ellingrod,[d] Richard Hansen,[e] S. Suresh Madhavan,[f] Terrence J. Monks,[g] Marilyn E. Morris,[h] and Joan M. Lakoski (Staff Liaison)[*]

[a] University of Maryland
[b] University of North Carolina at Chapel Hill
[c] Butler University
[d] University of Michigan
[e] Auburn University
[f] West Virginia University
[g] Wayne State University
[h] University at Buffalo, The State University of New York
[*] American Association of Colleges of Pharmacy

INTRODUCTION

The Research and Graduate Affairs Committee (RGAC) was charged in 2014-2015 with an important and timely charge from President Patricia Chase. The members of the RGAC were assigned to develop a report recommending a competency-based yet practical model of graduate education and post-graduate education (including postdoctoral training both basic and clinical) applicable to the diversity of programs offered by the colleges and schools of pharmacy. Examination of accessibility, affordability and accountability of graduate and research education has been addressed by this talented and committed group of dedicated committee members.

Under the leadership of Natalie Eddington (Chair), the RGAC received an extended appointment and all members agreed to continue their service. This group was charged by President Cynthia Boyle to complete the original charges, advise the new chief science officer (Joan Lakoski), participate in AACP strategic planning to develop future goals for research and graduate education, and provide evaluation and feedback on the newly formed Academic Research Fellows Program (review of the initial two cohorts; 2013-2014 and 2014-2015). The RGAC met twice in person and by conference calls throughout the duration of the appointment.

BAKCGROUND: GRADUATE EDUCATION IN ACADEMIC PHARMACY

Review and discussion of competency-based models of graduate education began in the fall of 2014 and has continued throughout the second year of the RGAC activities. Following an intense yet productive discussion at the November 2015 committee meeting, the decision was made to collect additional information on the current issues facing graduate education in the colleges and schools of pharmacy via two formats, including (1) focus group discussions and (2) a customized survey to the colleges and schools of pharmacy. Both the focus groups and survey were conducted to address the gaps in current knowledge of the status of graduate education, including postdoctoral training, in the academic pharmacy community; any duplication of information from existing AACP surveys was carefully avoided. Overall, the goal of this data collection effort was to provide the most current snapshot possible of the graduate education in the colleges and schools of pharmacy to inform the work of the RGAC and the pharmacy schools engaged in training the next generation of researchers.

Graduate Education Focus Group Discussions

The focus groups were held during the AACP Interim Meeting in February 2016 (Tampa, FL). Due to the substantial interest in this topic, three separate focus groups were held with the same series of questions presented to each group (see Appendix 1 for AACP 2016 Research and Graduate Affairs Focus Group Questions). A total of 36 individuals participated in three focus group discussions and representing 36 colleges and schools of pharmacy. The focus group questions were designed to provide a qualitative picture of the opportunities and challenges facing the participants, most of whom had responsibilities for oversight and stewardship of graduate (predoctoral) and postdoctoral education that span training for research in basic, clinical and translational settings. The RGAC is most grateful to the individuals who took time to participate in a focus group as these discussions were most helpful in providing important illustrations of the challenges facing each of the participants.

Graduate and Postdoctoral Education Survey

The RGAC also developed a series of questions to gain quantitative data on the current status of graduate and postdoctoral education and training; all colleges and schools of pharmacy were invited to participate in this web-based survey conducted in March 2016. The survey questions were carefully developed by the RGAC on the themes of accessibility, affordability and accountability (see Appendix 2 for AACP 2016 Research and Graduate Affairs Survey Questions). The results were compiled across each question with all results remaining anonymous. The RGAC was pleased with the high level of participation from the academic pharmacy community with 72 institutions providing responses to the survey. The committee recognizes that each of the participating schools or colleges devoted considerable time and energy to providing accurate and timely information on financial data supporting graduate education, assessment practices and information related to next steps in the career progression of graduates of their respective graduate- and postdoctoral-level programs.

Additional Information on Graduate and Postdoctoral Education

Additional sources of information reviewed by the RGAC utilized conference calls with key experts on career outcomes and professional development of trainees, including Dr. Kay Lund, Biomedical Workforce Director, Office of the Director, National Institutes of Health (March 2016), and with Dr. Roy Hawke, Chair, Graduate Education SIG (University of North Carolina, Chapel Hill) (May 2016). Additionally via communication with the Pharmacy Deans Research Group, numerous examples of competency-based graduate education criteria were obtained from a number of established graduate programs based in colleges and schools of pharmacy. Additionally, Joan M. Lakoski, Vice President of Research and Graduate Education, AACP Chief Science Officer, reported to the RGAC on relevant findings from additional meetings and publications held during the 2015-2016 academic year which included attendance at the Council of Graduate Schools Annual Meeting (Seattle, WA; December 2015) and the Innovations in Graduate Education Conference, National Institute of General Medical Sciences (Bethesda, MD; April 2016) among others.

Taken all together, the RGAC has collected a timely and highly relevant body of information on the current status of graduate education as well as postdoctoral training, including both basic and clinical sciences, in the academic pharmacy community. The results of this comprehensive, in-depth consideration of accessibility, affordability and accountability of graduate education, including the data obtained from survey results, annual AACP surveys, insights from the focus group discussions, meetings with experts on workforce development along with review of the literature, together provide a framework for providing the academic pharmacy community with several policy recommendations as listed below.

In addition, the RGAC is currently preparing a series of manuscripts that will provide a detailed yet comprehensive picture of the current strengths, weaknesses, challenges and opportunities that face graduate education across our nation – and with reference to the academic pharmacy community.

POLICY RECOMMENDATIONS FOR GRADUATE EDUCATION

From the body of work collectively undertaken, the RGAC has developed several policy recommendations (see below). Each recommendation is provided along with a brief summary of the most relevant issues that underscore their respective contribution to guide the continued growth and development of new graduate programs and services. In many respects the outstanding contribution of the academic pharmacy community to the education of the next generation of researchers in a wide variety of disciplines remains a hidden gem – the professionals trained in research in the colleges and schools of pharmacy, whether basic, clinical and/or translational fields, provide a vital contribution to the nation's research capacity that is deserving of recognition. Yet continued effort including attention to continuous improvement of graduate education programs is essential and needed to sustain and growth the impact of pharmacy research as it contributes to the nation's health.

Policy Statement 1: *AACP will work with the colleges and schools of pharmacy to promote innovation and excellence in graduate education programs, including new and established programs, to provide graduate students and postdoctoral trainees with professional development skills and career guidance that best prepares them for success in a wide array of opportunities in the workforce.* (Source: 2014-2016 Research and Graduate Affairs Committee)

According to the NIH 2012 Biomedical Research Workforce Working Group report, approximately 30% of biomedical PhDs work in the biotech and pharmaceutical industries in research and non-research positions. To that end career development programs, and/or supplemental focused training opportunities should be established to ensure our graduates are successful. Career development programs must equip our students for various career opportunities as well as options. It is our goal to develop programs based on best practices and provide those training programs to the academy. These programs may include: leadership, teamwork, and project management, for careers in academia, pharmaceutical industry, federal

government, and policy positions. The goal here would be to develop and better align career development and professional programs with the evolving workforce needs, so that our graduates are competitive and successful in the workforce.

Policy Statement 2: *AACP encourages member institutions to conduct regular external peer reviews and assessments of their graduate education programs, including masters, doctoral, and postdoctoral programs, in order to achieve and sustain excellence in research training.* (Source: 2014-2016 Research and Graduate Affairs Committee)

Survey results indicated that less than half of the schools reporting conducted regular assessments of their programs or have core competencies designed for their graduate and postdoctoral education programs. Advantages of conducting assessments including providing programs with information and guidance to enhance program effectiveness, identification and implementation of solution-focused improvements, being better able to meet needs of diverse students, engagement of faculty in the research education, and even prepare colleges and schools to successfully obtain extramural funding for their training and research programs. Excellence in graduate education is achieved and sustained with a culture of program assessment based on core and discipline-specific competencies along with external peer reviews. To that end, competencies should be developed and include the following areas: literature review and evaluation, hypothesis generation, research methods and study design, statistical methods and data evaluation, grantsmanship, preparation and delivery of oral and written scientific information, scientific leadership, self-management leadership, cross-disciplinary teamwork, and ethical conduct of research. Best practices in graduate program review should include an external review committee with the requisite expertise to appropriately evaluate the program and provide substantive recommendations. In general, the following areas would be examined as part of the review process: curriculum, research experiences, faculty, funding models, students (and graduates) as well as program challenges and opportunities.

Policy Statement 3: *AACP will work to foster training to prepare graduate students, postdoctoral fellows and new faculty for successful careers in academic pharmacy so they can contribute to both the education and research missions of the colleges and schools of pharmacy.* (Source: 2014-2016 Research and Graduate Affairs Committee)

Current approaches in graduate education in schools and colleges of pharmacy, as well as other graduate programs, may not adequately prepare biomedical scientists for careers in academic pharmacy. Anecdotally, there are missed opportunities for graduate and PharmD students training within the same institution to explore/examine the potential role that they might have together in academic pharmacy or to develop an understanding of the role of science in pharmacy. We do know from the NIH Biomedical Workforce report that the numbers of graduate students entering academia is decreasing. So there may be an impending deficit of scientists in schools and colleges of pharmacy who are equipped to be successful researchers *and* effective educators. To build the next generation of researchers who will become faculty, we need to provide opportunities for a better understanding of pharmacy and didactic training in education as part of their formative experiences as graduate students postdoctoral fellows and/or junior faculty.

FUTURE DIRECTIONS FOR GRADUATE EDUCATION

The RGAC has been privileged to review and consider the many dynamic and successful graduate education programs that are well established in the colleges and schools of pharmacy. The RGAC also acknowledges that there is considerable growth currently ongoing in the development of new educational programs in the academic pharmacy community, including the recent attention to Masters level degree programs that provide highly specialized, successful niche-oriented programs (e.g., pharmacogenomics, health information technology). Commitment to development of new approaches and innovation in graduate education is also needed to best prepare the graduates of pharmacy educational research programs to prepare trainees to be able grow and adapt to changes in the employment sectors throughout their life-long professional career.

The above listed policy recommendations are provided by the RGAC as steps to strengthen and enable the successful development of innovative and highly attractive graduate and postdoctoral educational opportunities, including clinical research programs, that will continue to attract the next generation of future leaders of our nation's research endeavors.

REFERENCES

Biomedical Research Workforce Working Group Draft Report (A Working Group of the Advisory Committee to the Director, National Institutes of Health, June 14, 2012 http://acd.od.nih.gov/Biomedical_research_wgreport.pdf.

APPENDIX 1

AACP 2016 Research and Graduate Affairs Focus Group Discussion Questions
　　The following questions were used for discussion with each group of participants (February 21 and 22, 2016). A facilitator conducted the discussion and a notes were taken by a scribe for each session. While participants provided reflections based on the graduate programs in their respective institutions, information was not recorded and/or collected on the identity of the speaker and/or pharmacy school.

Focus Group Questions:

Accessibility:

1. What are some major "trends" in the environment that are either positively or negatively impacting graduate and post-graduate fellowship programs? (scientific, financial, institutional, applicant pool)
2. What strategies have you found to be successful for the recruitment of underrepresented minorities (URMs) or women?
   a. Are there university resources that you can use in these efforts?
   b. Once these students are admitted, are there any special program and training provided to them to facilitate their success?
   c. Has your program seen any differences in the success rates of URMs or women for your program?

Affordability:

3. Several factors including things like state budget cuts, decrease in research funding, and difficult job market for PhDs and Research Fellows may impact the research and graduate education mission of the school and its faculty.
   a. List and briefly describe factors that have impacted the research and graduate education mission of your school and the productivity of your faculty.
   b. Describe a few strategies that you have adopted to respond to the above challenges that you found to be effective.

Accountability:

4. Have you identified specific competencies that your graduate students or post-doctoral fellows must possess or demonstrate prior to graduation?
   a. What are they?
   b. How do you ensure minimum competencies across all of your graduate and post-graduate programs?

5. As an *Insert position* (Associate Dean for Research, Graduate program director, senior faculty, or dean, etc.) what kind of evaluations (assessment/performance reports) do you have to provide to the Dean of your school/college or the University governance/leadership?
   a. What are some important metrics required for such reports?
   b. Do you conduct exit interviews of your graduates for program evaluation purposes?
   c. How are annual performance reviews of graduate students and post-doctoral fellows conducted for program continuation or financial assistantships?

Recruitment:

6. What recruitment strategies do you use that you find to be effective?
7. What are the various sources of student applications for your graduate or post-graduate fellowship program?
   a. What are the sources of funding you have to support these individuals? (internal e.g., teaching assistantships or external e.g., NIH training grants or students/postdocs, including post-PharmD fellows/postdocs) supported by NIH fellowships).
8. While schools admit students on a competitive basis, what admission criteria do you find useful in identifying the most research capable and motivated students for your program?

Job Opportunities for graduates:

9. What are the employment opportunities for your graduates?
   a. Are your graduates happy with the employment opportunities that are presently available?

Future:

10. Given the present situation, briefly describe a few positive and/or negative trends that you see in the future that are likely to impact research, graduate, and post-graduate education.

Appendix 2

AACP 2016 Research and Graduate Affairs Survey Questions
  The following questions were developed by the Research and Graduate Affairs Committee and used for a survey conducted in March 2016. AACP staff forwarded the survey to all colleges and schools of pharmacy for their participation and no institutional affiliations were recorded.

Survey Introduction
  AACP has established a Research and Graduate Affairs Committee charged with evaluating the accessibility, affordability and accountability of graduate and post graduate education in Schools of Pharmacy. This review includes collecting data on current graduate and postgraduate/fellowship programs (including those with a PharmD in a research fellowship), challenges to continued success, and future prospects.
  Please provide information on your graduate and postgraduate programs in the School/College of Pharmacy to address the following questions:

1. (a) How many graduate and postgraduate programs are present in your School/College?
   (b) Please indicate your specific programs
   (c) Do your faculty mentor students in interdisciplinary or other programs outside the School/College of Pharmacy? If yes, name of interdisciplinary program(s)
2. How many trainees are currently enrolled in the (a) PhD program, (b) MS program, (c) post PharmD fellowship, (d) post PhD fellowship?
3. What is the average time to completion of your (a) PhD program, (b) MS program, (c) post PharmD fellowship, (d) post PhD fellowship?
4. Please identify the approximate sources of funding for graduate and post-graduate students in your program(s). All columns should sum to 100%.

5. Provide follow-up data on graduate student and postdoctoral fellow placement after graduation for the last 5 years:
   Academia/Research Institutes
   Industry
   Government
   Other (please describe)

6. Of those above, how many of your PhD graduates went into a postdoctoral training program over the last 5 years?
   Academic post doc_____
   Other_____

7. Of those above, how many of your PharmD graduates went into a postdoctoral training or residency program over the last 5 years?
   Academic post doc_____
   Other_____

8. How is your graduate program assessed? (External Review, Internal Review, Internal and External Review, None, Other)
Please state the organization that conducts the review for external evaluations outside of the college of pharmacy.
If your graduate program is assessed by internal or external review, answer the following:
How frequently is your graduate program evaluated/assessed? (give options)
What types of data are typically collected as part of your assessment of graduate programs? Among those items that you assess, identify up to 5 of the most influential items in your review of the graduate program.

Assessed	Most Influential	Description
☐	☐	Graduation Rates
☐	☐	Placement and Employment Rates of Recent Graduates
☐	☐	Pass Rates for Dissertation and Thesis Proposals
☐	☐	Pass Rates for Dissertation and Thesis Defenses
☐	☐	Pass Rates for Qualifying and Comprehensive Exams
☐	☐	Pass Rates on Professional Certification Exams
☐	☐	Acceptance Rates for Applicants to Program

(*Continued*)

(*Continued*)

☐	☐	Admission Test Scores
☐	☐	Instructor Evaluations
☐	☐	Course Evaluations
☐	☐	Course Grade Distributions
☐	☐	Documentation of Student Progress by Advisor or Committee
☐	☐	External Evaluations of Dissertations and Theses
☐	☐	Feedback from Current Students (other than course/instructor evaluations)
☐	☐	Feedback from Past Students
☐	☐	Feedback from Employers
☐	☐	Feedback from Peer Institutions
☐	☐	Scholarly Productivity of Students
☐	☐	Assignment Load and Hours for Supported Students
☐	☐	Evaluation of GTA/GRA Performance by Supervisor
☐	☐	Evaluations of GTAs by Students
☐	☐	Other _____

Funding Source	Student Type			
	MS	PhD	Post-PharmD fellow	Post-PhD fellow
College/School*				
Faculty-NIH/NSF/FDA grant				
Faculty-Foundation or other non- government Grant/Contract				
Faculty-Industry support				
Other**				

*Indicate source of funding:

**Indicate Other: