ACS Chemistry for Life™

Presidential Commission on Graduate Education in the Chemical Sciences

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ACS President

CHARGE:

- What are the purposes of graduate education in the chemical sciences?
- What steps should be taken to ensure that they address important societal issues as well as the needs and aspirations of graduate students?

WORKING GROUPS

1 DEPARTMENTAL STRUCTURE

Original Question: Is the current structure of different types of departments in the chemical sciences (chemistry, chemical engineering, chemistry and biochemistry, chemistry and chemical biology, chemical and biomolecular engineering, etc.) a strength or a weakness with respect to graduate education?

Major Points of Early Discussion:

- Do the classic subdivisions of chemistry still have an organizational purpose?

- Are subdivisions useful or necessary for the operation of big departments?
- Is there a better solution to the problem of evaluating contributions to team efforts, including interdisciplinary work, with regard to credit for students, faculty compensation, tenure, or other matters?

Members: Peter Stang, Chair; Bill Banholzer, Richard Cavanaugh, Pat Confalone, Frank DiSalvo, Mike Doyle, Paul Houston, Anne Myers Kelley, Matt Tirrell

2. Education for Employment

Original Questions: What are the employment issues for graduate students in both industrial and academic settings? Are we providing the right educational opportunities?

Major Points of Early Discussion:

- What are the employment issues for graduate students in both industrial and academic settings?
- Are we providing the right educational opportunities?
- Do we all agree that "fearlessness" is a valuable trait for graduate students, and if so, can we teach or at least develop this trait?

Members: Gary Calabrese, Co-Chair; Bill Banholzer, Co-Chair; Jacqueline Barton, Stacey Bent, Ron Breslow, Pat Confalone, Michael Doyle, Marye Anne Fox, Joe Francisco, Paul Houston, Chad Mirkin, Diep Nguyen, Larry Overman, Peppi Prasit, Hunter Rawlings, Geraldine Richmond, Melanie Sanford, Richard Scheller, Joel Shulman, Matt Tirrell, George Whitesides, Mark Wrighton

3 Student Support Mechanisms

Original Questions: What are the financial support mechanisms for graduate education in the chemical sciences? Is the current mix the best one?

Major Points of Early Discussion:

- The current system of student support is not working well for students or faculty. Alternatives merit exploration.
- The GAANN (Graduate Assistance in Areas of National Need) program was identified as a good model for fellowships.
- Is it possible to better approach an "ideal" system, perhaps one year of real teaching experience (not just running a lab session), two years of some sort of fellowship support, and two years of support from the faculty mentor's research grants?
- Is it practical to encourage home-country fellowship support for foreign graduate students who plan to return to their home countries after completing their degrees?

Members: Jacqueline Barton, Co-Chair; Joel Shulman, Co-Chair; Hector Abruña, Ron Breslow, David Feldon, Paul Houston, Larry Overman

4 Sources and Prior Preparation of Students

Original Questions: Is the current profile of our graduates the correct one, not only in terms of domestic vs. international, but in terms of diversity along other axes as well? Do they have the proper background for the type of graduate education we want them to attain?

Major Points of Early Discussion:

- What is a healthy balance of international

and domestic students?

- Should more attention be paid to English proficiency of international students?
- What effective measures could be taken to improve retention of domestic graduate students?
- Toward better preparation of undergraduates, would it be wise to emphasize better teaching in the first two years and a research experience later?

Members: Paul Houston, Co-Chair; Geraldine Richmond, Co-Chair; Michael Doyle, Marye Anne Fox, Carlos Gutierrez, Shirley Malcom, Susan Olesik, Hunter Rawlings, Isiah Warner

5 Institutional Expectations of Students

Original Questions: What are the expectations of graduate students; are our educational institutions meeting them, and what promises do they make to students, both explicitly and implicitly? In particular, what should be the lengths of the graduate student program and any subsequent postdoctoral training? And why is the attrition rate for Ph.D. students in the chemical sciences as high as it is? (Only 62% finish within ten years.)

Major Points of Early Discussion:

- Does the community have particular expectations in terms of workload, degree of independence vs. time in program, role of the doctoral committee, and other matters?
- What is an appropriate time to degree in a doctoral program? Can the average be influenced favorably?
- How can safety practices be more effec-

tively integrated into graduate research and education?

- What are the most important reasons for attrition from doctoral programs? Is the current rate too high?

Members: Chad Mirkin, Co-Chair; Matt Tirrell, Co-Chair; Stacey Bent, Gary Calabrese, Jeff Evanseck, David Kliger, Anne McCoy, Geraldine Richmond, Richard Scheller, Joel Shulman

BIG QUESTIONS GROUP

- What are the purposes of graduate education in the chemical sciences?
- What steps should be taken to ensure that they address important societal issues as well as the needs and aspirations of graduate students?

Members: Larry Faulkner, Chair; Jacqueline Barton, James Duderstadt (President Emeritus and University Professor of Science and Engineering at the University of Michigan, former chair, National Science Board), Paul Houston, Hunter Rawlings, Gary Schuster, Bassam Shakhashiri, Charles Vest (President of the National Academy of Engineering and President Emeritus of the Massachusetts Institute of Technology), George Whitesides, Mark S. Wrighton

Comments and Suggestions:

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