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Committee on Professional Training

American Chemical Society 1155 Sixteenth Street, N.W. Washington, D.C.

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Attend the following symposia during the upcoming Spring 2007 ACS National Meeting in Chicago:

- **YCC/CUR Symposium: Starting a Successful Research Program at a Predominantly Undergraduate Institution.**
- **The Development and Implementation of Learning Objectives in Chemistry Departments: A View of Progress at a Myriad of Institutions.**

See Page 2 for details.

Chemistry Community Feedback on the Proposed ACS Guidelines Changes

The participants at the CPT symposium at the Fall ACS National Meeting brainstorm innovative curricula using the proposed revised ACS Guidelines.

In 1936, the American Chemical Society (ACS) established a program for approving undergraduate chemistry programs as a means of promoting excellence in chemical education. ACS charged the Committee on Professional Training (CPT) with developing and administering the ACS Guidelines for approval of undergraduate chemistry programs. These guidelines have undergone regular revision over the years to maintain their utility and relevance. Recognizing that major changes are occurring both in the chemistry profession and in chemistry education, CPT is currently undertaking a major revision of the ACS Guidelines.

Progress Report

During 2005, the chemistry community was informed of the upcoming revision of the ACS Guidelines, and there was a broad call to identify important issues and possible directions for change. CPT received numerous comments from the chemistry community in response to newsletter and journal articles and at symposia, presentations, and CPT open meetings.

In early 2006, the Committee used this input to propose a set of revisions to the ACS Guidelines. The goals of the proposed changes were to simplify the guidelines, increase flexibility in the curriculum, encourage innovation, and provide infrastructure requirements that support excellence.

The proposed curriculum revisions include requiring foundation coursework of one semester beyond general chemistry in each of the following areas: analytical, biochemistry, inorganic, organic, and physical chemistry. The foundation coursework is to be followed by the equivalent of four semester courses (totaling at least 12 credit hours) of in-depth coursework. At least 400 laboratory hours beyond general chemistry would be required, ideally involving all five major areas of chemistry. Current ACS-defined degree options would be replaced by department-defined degree tracks. Beyond teaching chemistry content, curricula should promote the development of skills that students need to become successful professionals. Most of the infrastructure requirements would remain the same; however, it was proposed that the minimum number of faculty in an approved program be increased from four to five (currently approved four-member programs could remain approved if all other requirements are met). Chemistry programs would be required to conduct self-assessments regularly in order to evaluate and improve their overall effectiveness. The complete description of the proposed changes is available at the CPT website (www.chemistry.org/education/cpt).

These proposed changes were again widely publicized with a call for feedback through a direct mailing to all chairs of currently ACS-approved chemistry programs, a *CPT Newsletter* article mailed to every faculty member at approved programs, a *Journal of Chemical Education* editorial, and a *Chemical & Engineering News* comment column. Many opportunities were available for interactive discussions, including an extended CPT open meeting at the Spring ACS National Meeting in Atlanta, attended by nearly 100 participants; a symposium at the Biennial Conference on Chemical Education, involving more than 80 participants; an interactive session at the Council on Undergraduate Research National Conference attended by more than 20 participants; a symposium at the Fall ACS National Meeting in San Francisco with more than 60 participants; and presentations at various regional meetings.

Chemistry Community Feedback

CPT has received more than 80 responses from department chairs summarizing their departments' opinions on the proposed guidelines revisions. The

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vast majority of these responses were generally supportive of the direction of change, but many responses contained suggestions and questions. The most common comment by far was support for increased flexibility in the curriculum, followed by support for departmental control over degree tracks. Numerous comments were also received about the proposed curriculum changes, including the perception that the proposed changes would result in more innovative and student-oriented programs. Several respondents wondered if there was too much flexibility in the proposed revisions, in particular because only one semester of foundation coursework is required for each of organic and physical chemistry.

Under the proposed revisions, it is the responsibility of the department to define the coursework associated with a degree track. As part of a chemistry degree track, most departments will likely choose to require the second semesters of organic and physical chemistry as two of the in-depth courses that an ACS-certified major must take. But the proposed revisions would also allow a department to implement a degree track in a chemistry-related specialization with one semester of coursework in some or all of the foundation areas, similar to the flexibility that is currently permitted under the ACS-approved option degrees. In the opinion of CPT, the proposed curricular changes put the responsibility for student learning where it belongs, with the department, where it can best be implemented and evaluated. Ultimately, however, the department will need to determine whether its implementation is effective through program self-assessment.

A relatively common suggestion regarding the proposed guidelines revision was that it should be preferred, not required, that the physics cognate requirement be fulfilled by calculus-based physics courses.

Clarification was requested regarding the role of introductory (general) chemistry courses, the practicality of expecting coverage of five foundation areas in four foundation laboratory courses, and how to count in-depth semester credit hours and laboratory hours. There was concern about the proposal of increasing the minimum number of chemistry faculty from four to five, despite the assurance that currently approved four-member departments could remain approved. Regarding this proposed change, there were also questions about how to count faculty in cases where a faculty member from another department also teaches chemistry students (e.g., a biologist teaching biochemistry).

Audience participants during the guidelines-related open meeting and symposia echoed many of the written comments. Support was expressed for recognition of the importance of opportunities that allow students to develop process, communication, and teamwork skills in the proposed changes to the guidelines. Regular self-assessment was generally viewed as being very valuable for departments. Questions were asked about how to evaluate the learning of student skills and whether self-assessment would impose an undue administrative burden on departments.

These suggestions, questions, comments, and concerns will greatly inform the Committee as it works to develop the next edition of the ACS Guidelines. All suggestions will be considered, and clarification will be provided wherever possible. Additional resources will be developed to help understand and implement the revised guidelines, including a frequently asked questions (FAQ) document with answers, revised supplements to the guidelines, and online resources that describe approaches to carrying out department self-assessments.

Future Plans

The next step in the guidelines revision process is for CPT to consider the feedback it has received and develop a draft of the new ACS Guidelines. This draft will include many items from the previous guidelines for which changes were not proposed, clarifications of the proposed changes wherever possible, and quite likely some modifications from the proposed revisions based on the community feedback. The draft of the new guidelines will again be widely publicized with another call for feedback. This feedback will be discussed by CPT, after which the final wording of the new ACS Guidelines will be released.

Staying Involved

The Committee greatly values the thoughtful comments made by individuals and chemistry departments concerning the revision of the ACS Guidelines. By working together, we will develop a set of guidelines that serves our students and the chemistry profession well. Please stay involved by making your opinions known regarding the current proposed guidelines changes and the forthcoming draft of the new guidelines. Send comments to CPT by e-mail at cpt@acs.org with a subject heading of "ACS Guidelines Revision." Your participation and oral comments at future guidelines-related symposia will also be extremely valuable.

Education is a shared concern of the entire chemistry community. CPT wishes to involve all chemistry constituencies in developing the next release of the ACS Guidelines. ■

Attend the following symposia during the upcoming Spring 2007 ACS National Meeting in Chicago:

The Development and Implementation of Learning Objectives in Chemistry Departments: A View of Progress at a Myriad of Institutions

Organizer: ***Marcy Towns***

Currently, many chemistry departments are in the process of crafting goals and learning outcomes for their chemistry programs. Faculty must clarify their expectations for student learning, and consider how the curriculum and the pedagogy used in the classroom and laboratory matches their expectations for student learning. These efforts allow departments to develop cohesive curricula aligned with program objectives that are informed and shaped by formative and summative assessment. There is a need to communicate nationally about these efforts and share models. The goal of this symposium is to highlight the development and implementation of programmatic assessment at a range of institutions. Presenters will share learning objectives, associated assessment plans, and preliminary data.

Starting a Successful Research Program at a Predominantly Undergraduate Institution

Organizer: ***Merle Schuh***

Many new faculty members at predominantly undergraduate institutions (PUIs) do not have a good understanding of the unique challenges associated with establishing an active research program involving undergraduates. At a half-day symposium, faculty members and administrators from PUIs, who have had successful undergraduate research programs and program officers from The National Science Foundation and Research Corporation, will address the topic. They will speak about ways to handle issues associated with undergraduate research and will facilitate open discussion sessions on a range of related topics. The setting for the symposium will be relatively informal to give members of the audience ample opportunity to ask questions and interact with the panel of facilitators. Address any questions to meschuh@davidson.edu

Paving the Pathways for Tomorrow's Chemistry Students: Part 2

Jodi Wesemann, *Assistant Director, American Chemical Society*

The world of higher education is changing. Student demographics are becoming more reflective of our society, the number of postsecondary students is increasing, and the pathways students follow are becoming more varied.

Part 1 of this series provided an overview of the student statistics and the array of student transfer policies.[1] In this installment, a closer look will be taken at the ways in which the science and chemistry communities support students transferring between academic institutions.

Although the research on postsecondary student transfer in the sciences is limited, the focus on economic competitiveness and broadening participation is prompting more studies.[2] A recently established website (www.pathway2stemdegree.org) is being developed to serve as a clearinghouse for relevant studies and resources.

Among the resources cited in the website is the National Academies report, *Enhancing the Community College Pathway to Engineering Careers*.[3] After holding meetings, reviewing the literature, hosting a workshop, and collecting and analyzing data, the study committee that prepared the report concluded that community colleges have not achieved their full potential for several reasons:

- A lack of understanding among parents, teachers, counselors, and students of the effectiveness of community colleges in producing engineering graduates;
- Less-than-effective articulation agreements (policies and programs designed to foster transfer) between community colleges and four-year institutions; and
- A lack of cooperation and coordination among high schools, community colleges, four-year institutions, and state higher education agencies.

Similar concerns about student transfer in chemistry have prompted discussions within the American Chemical Society. The Society Committee on Education (SOCED) and the Committee on Professional Training (CPT) cosponsored the symposium, "Revising the ACS Guidelines for Two-Year and Four-Year Programs: A Community Dialogue of Issues and Opportunities," at the 19th Biennial Conference on Chemical Education.[4] The symposium, "Community College Programs Designed to Help Students Transition to Four-Year Colleges and Universities," held at the 232nd ACS National Meeting in San Francisco, was cosponsored by SOCED. CPT also invited input from the community in Part 1 of this series.

Sharing Strategies

The presentations, discussions, and written responses have highlighted how faculty and administrators at both community colleges and four-year institutions are addressing the issues associated with student transfer and tapping into opportunities to strengthen their programs.

Three questions were raised in Part 1 of this series. Although not a scientific survey, the responses provide insights that may be helpful to others also seeking to facilitate student transfer.

Articulation agreements are necessary, but not sufficient, for seamless transfers. Cooperative efforts, fostered by communication and resource sharing, are also needed.

How do you ensure that transfer students have the prerequisites needed for chemistry courses?

The majority of respondents indicated that their states had a disciplinary group, committee, or task force that developed a framework to inform such decisions. In some states, such as Texas and Florida, common course numbers have been established. In other states, such as Illinois and Ohio, course equivalencies are being determined and transfer guides developed. Institutions under the Kansas Board of Regents are using a common syllabus for the science majors' general chemistry course. Block equivalencies are established when one-to-one comparisons are complicated by different academic calendars or unique programs, or simply to facilitate transfer. For example, Arizona has science-oriented block transfer agreements. Seminole Community College in Florida has developed the science diploma program.

Those attending the National Academies workshop on engineering pathways indicated that "articulation agreements are necessary, but not sufficient, for seamless transfers."[3] Cooperative efforts, fostered by communication and resource sharing, are also needed.

Advising was among the cooperative efforts cited by the chemistry community. Whether being advised formally or informally, students benefit from being encouraged to contact faculty at their transfer institution. Faculty involvement is also important. At the College of DuPage in IL, where student advising is not required, faculty gather information about students' future plans and goals, letting the students know if they are taking inappropriate courses.

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In terms of logistics, the development of electronic systems has facilitated the process of tracking and checking prerequisites. Transfer guides are also being disseminated electronically.

How do you ensure that the level of courses that students have taken is appropriate?
If disciplinary groups have not taken on this task, course descriptions and syllabi are generally reviewed to determine whether courses are equivalent. In several cases, learning outcomes are being used as the basis of such decisions. The Chemistry Department at San Jose State University has held a series of meetings with faculty from transferring institutions to identify common learning outcomes. In Ohio, learning outcomes are being used as the basis for developing disciplinary Transfer Assurance Guides.

Many chemistry programs use ACS Exams to demonstrate course equivalency and student preparation. Although ACS Exams are the only assessment tool used in some cases, a number of programs are using them in conjunction with other assessment tools.

In the case of laboratories, instrumentation sharing has been used to ensure that students are exposed to appropriate techniques. Advances in technology have allowed the use of instrumentation remotely, which is particularly valuable when institutions are not close in proximity.

How do you ensure that students have sufficient support prior to and after transferring?
The wide range of answers to this question reflect the many facets of adjusting to a new institution and academic culture.

- Orientation and advising programs. Extended programs, and in some cases, centers at the transferring institutions have been developed to foster students' introduction to new institutions and provide advance advising to potential transfer students. The admissions program at Texas Wesleyan University is working with the Tarrant County Community College system and more than a dozen two-year programs outside the county.
- Summer programs. Illinois State University and San Jose State University are among the institutions offering bridge programs. Summer camps also offer students a chance to become familiar with the campus prior to transferring.
- Student organizations. Involvement in chemistry clubs or Student Affiliates chapters provides a support network at both transferring and receiving institutions.
- Experiential learning. Faculty at San Jose City College are among those using learning communities, Peer-Led Team Learning, and service learning in their courses.
- Special courses. To help prepare transfer students, Illinois State University is supporting required sophomore courses at neighboring community colleges where enrollment would not have supported such offerings. Santa Rosa Junior College is offering quantitative analysis.
- Research opportunities. Students have opportunities to do research at the University of California–Santa Cruz before they transfer (ACCESS program) and after (Minority Access to Research (MARC), Summer Undergraduate Research Fellowships (SURF), and Academic Excellence Program (ACS) programs). A two-semester research course is available at the Community College of Southern Nevada. The institutions involved with the National Science Foundation's (NSF) Undergraduate Research Collaboratives (URC) are also involving first- and second-year community college students, both in and out of the classroom.
- Development of student skills. The Science Skills Center at American River College offers a half-credit course that covers time management, learning styles, previewing of text, annotation of text, paraphrasing, note-taking, concept mapping, and test-taking strategies. The Academic Resource Center at Texas Wesleyan University works with area community colleges.
- Mentoring. Interactions with faculty benefit many transfer students. At Contra Costa College, a science, math, and engineering mentoring course (INDIS 095) has been established, formalizing the efforts that are occurring at community college campuses across the country.

Such efforts minimize transfer shock, hopefully preventing a drop in GPA upon transfer, and help students be successful as they pursue their goals.

Although addressing the range of issues associated with student transfer involves a multitude of details and programs, those making progress have all relied on a simple strategy—associating with colleagues from other institutions.

Learning More

The studies and discussions that have focused on student transfer in the sciences have raised more questions and highlighted the need for more research on the effectiveness of various activities, programs, and policies benefiting the wide range of science students.

The National Academies workshop identified five areas for further research:[3]

- Articulation agreements to facilitate seamless transfers of students to four-year institutions;
- Recruitment and retention of engineering students by leveraging the special position of community colleges as "colleges within communities";
- Curricular content, quality, and standards;
- Diversity; and
- Data collection.

Such research across the STEM disciplines will help identify the special challenges and opportunities the science community has in attracting and developing new scientists and engineers.

Increasing Interactions

Although addressing the range of issues associated with student transfer involves a multitude of details and programs, those making progress have all relied on a simple strategy—associating with colleagues from other institutions. Such interactions occur in a variety of venues—respondents cited disciplinary student transfer groups, disciplinary education associations, and ACS Local Section activities—that allow discussion of the issues in a collegial environment. Faculty exchanges were also cited as ways to learn more about the environments from and to which students are transferring.

Such interactions are the first step in implementing the recommendations that came from the 18th Biennial Conference on Chemical Education symposium, "Undergraduate Transitions: Enhancing Student Success."

CONGRATULATIONS!

The Committee congratulates the following schools on their newly ACS-approved bachelor's degree programs in chemistry:

Central Washington University
Kutztown University of Pennsylvania
The University of Texas at Tyler

The current number of ACS-approved programs is 639.

Increasing awareness, improving communication, and developing partnerships takes time, but efforts are more readily sustained with an understanding of what needs to be done and why.

Several presentations during the 232nd ACS National Meeting symposium, "Community College Programs Designed to Help Students Transition to Four-Year Colleges and Universities", demonstrated how such interactions can grow. After working on teacher preparation, Sinclair Community College and Wright State University now have a $2 million NSF STEM Talent Expansion Program (STEP) grant. Harold Washington College and Illinois State University are 2 of the 13 institutions (10 Chicago community colleges and 3 Chicago baccalaureate institutions) involved in a $2.7 million, five-year NSF-URC grant. More than 300 students will be part of this project, which will study three models of using research as a transition enabler: scaffolding training, interdisciplinary team research, and distributed team research (a new model for multi-campus systems).

The four overarching themes in the National Academies report indicate areas of opportunity that appear to apply to the science community as well as the engineering community:

- Shifting program assessments from inputs to learning outcomes;
- The importance of collaboration;
- Diversity; and
- Raising awareness of the community college transfer mission.

Discussions and programming related to these themes will continue as CPT and SOCED revise the ACS guidelines for bachelor programs and two-year programs, respectively. The revisions will reflect the changes occurring in science and pedagogy and how the chemistry community responds to them. ■

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2. "A Bridge for All: Higher Education Design Principles to Broaden Participation in Science, Technology, Engineering and Mathematics." Building Engineering and Science Talent" San Diego, CA, February 2004; www.bestworkforce.org (accessed on October 4, 2006).
3. Mattis, M. C., and Sislin, J., Eds. *Enhancing the Community College Pathway to Engineering Careers*. National Academies Press: Washington, DC, 2005. Presentations are available at chemistry.org/education/cpt.
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Transforming the Organic Chemistry Lab Experience for Students and Educators: Reflecting on Ten Years of Green Chemistry at University of Oregon

Professor James E. Hutchison, *Chemistry Department, University of Oregon*

At the University of Oregon we have learned a great deal from our experience integrating green chemistry into the organic chemistry laboratory curriculum. In this article, I review our experience, highlighting how green chemistry offers practical benefits for institutions, enhances students' learning experiences, and provides diverse, new opportunities for educators. I also describe how the flexible, principle-based approach of green chemistry is facilitating faculty engagement in curriculum reform.

During the fall of 1996, the University of Oregon's Chemistry Department began to explore how we might incorporate the principles of green chemistry into our undergraduate organic chemistry laboratory curriculum. Our initial goal was to develop a new lab curriculum that would decrease our reliance on fume hoods, produce a less hazardous wastestream, and make the lab safer.[1, 2] Because green chemistry improves safety by eliminating hazards, as opposed to preventing exposure, the approach seemed ideal for implementation in the teaching lab. We quickly recognized a number of other important practical and pedagogical benefits, for example: (a) green chemical methods achieve hazard reduction at all reaction scales (micro to macro); (b) incorporation of green methods is an excellent opportunity to upgrade the organic lab curriculum (which, with the exception of scale reduction, had remained virtually unchanged throughout the past century); and (c) the curriculum provides a unique context for more detailed discussion of chemical haz-

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Planning for Graduate Work in Chemistry:
A Resource for the Students Considering Advanced Study

www.chemistry.org/education/cpt/graduatework

The ACS Committee on Professional Training (CPT) has revised its printed brochure, ***Planning for Graduate Work in Chemistry.*** Now in its 7th edition, this publication has been transformed into an interactive website with updated content and format that allow rapid navigation through suggestions on how to plan for graduate school. This online resource is designed to guide both domestic and international undergraduate students who are considering graduate work in chemical sciences in selecting a program that best meets their needs and aspirations. It provides advice on how to prepare for successful work in graduate school, how and when to apply for admission, and to some extent, what to expect once enrolled in graduate school. The online format provides an opportunity for more regular revisions, so CPT would like to hear comments from both students and their advisers on the content, functionality, and ease of use of this new resource. To submit comments or to get more information about this online publication, please contact Marta Gmurczyk at m_gmurczyk@acs.org or 202-872-4599.

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ards and the effects of chemicals on human health and the environment.

We found that the green chemistry approach resonates with students who embrace the opportunity to study how chemistry could be practiced in a manner that benefited society and protected the environment. Our experience shows that green chemistry is strongly enhancing the image of chemistry among students. Students are learning new skills under this approach, because they confront a wide range of complex problems to solve in green chemistry. For example, in our new curriculum, for each experiment, students examine how a "greener" method differs from the traditionally-used method and are asked how the greener method can be further "greened." This repeated exposure to the process of analyzing reaction conditions and finding alternative methods teaches students to: (a) assess the conditions for hazards and likelihood of exposure/release, (b) identify new methods that allow reduction of the hazards, (c) explore how alternative methods can affect the course and rate of reactions, and (d) assess the broader impact of the overall

More than 120 college and university faculty have participated in weeklong workshops here, and many are now implementing and developing greener materials at their own institutions.

process on safety and the environment. This aspect of the curriculum is especially empowering to students. They realize that armed with this knowledge, they can help disseminate better and more sustainable chemical practices throughout academic and industrial settings, acting as ambassadors of green chemistry.

The approach is also engaging numerous teacher-scholars whose careers have been (re)invigorated by the adoption and development of these new materials, and chemistry departments around the world are seeing the practical and pedagogical benefits of the approach and are investing time and resources in it. At the University of Oregon, a greener curriculum has been in place in our organic chemistry laboratory (typical enrollment of 250 each fall) for the past five years. More than 120 college and university faculty have participated in weeklong workshops here, and many are now implementing and developing greener materials at their own institutions. A growing number of these educators have been presenting their new materials and strategies at well-attended symposia at ACS national meetings, ACS regional meetings, and the Biennial Conference on Chemical Education.[3] There are now textbooks, numerous journal articles, stand-alone collections, and a searchable database—Greener Educational Materials (GEMs) for

Chemists—to assist faculty in adopting a greener curriculum.[4] In sum, there are many indicators that the chemistry community is embracing a greener curriculum both through adoption and materials development.

Perhaps the most important key to the successful incorporation of green chemistry educational materials into the organic lab curriculum is that the approach taken has been principled rather than prescriptive. This principled approach was initially derived from the scientific content, the 12 Principles of Green Chemistry,[5] but also from a desire to ensure a seamless merger of chemical concepts and techniques with green chemistry principles and to produce high-quality materials that would be readily accepted by those teaching within the organic lab curriculum.

An important advantage of a principled approach is the flexibility that it offers to educators and departments during adoption. Materials developed in this way can be readily adapted across a range of educational settings, from research universities to primarily undergraduate institutions to community colleges to high schools. It also means that faculty members have significant flexibility regarding how they incorporate green chemistry into their courses (in lectures or labs, one experiment at a time or wholesale adoption, etc.). Finally, it means that there are many ways in which educators can contribute to the further development of the field, resulting in greater participation in materials generation.

The rapidly growing GEMs database is providing a forum for discussion and further development of these materials as well as serving as a one-stop resource for educators seeking materials to incorporate into their courses.

Some recent examples highlight the ways in which this approach to curriculum development is engaging a wide swath of educators. In one example, a group of 15 educators pooled their efforts to incorporate green chemistry concepts throughout the non-majors' textbook, *Chemistry for Changing Times*. The group effort allowed the project to be completed in just five months. Faculty members around the country are taking a collaborative approach to developing and disseminating new materials to the community. The rapidly growing GEMs database is providing a forum for discussion and further development of these materials as well as serving as a one-stop resource for educators seeking materials to incorporate into their courses. The newly formed Green Chemistry Education Network is coordinating curriculum development efforts for high schools, community colleges, and four-year institutions at regional ambassador sites in New England, the Pacific Northwest, Arkansas, and Minnesota.[6]

In each of the examples cited above, we've found that one of most important keys to success has been a flexible approach that provides an opportunity for all interested parties to contribute to the development of the curriculum in whatever manner suits their talents, interests, and needs. Driven by a set of flexible, but strong, principles, these faculty are generating and adopting high-quality, effective materials. Given the success we've experienced with this approach, it is exciting and encouraging to note in the proposed changes to ACS Guidelines for undergraduate chemistry programs, that the Committee on Professional Training is considering, a similar principle-based approach that will provide educators and departments with greater flexibility to innovate within the curriculum.

For more information on green chemistry, the University of Oregon green organic lab curriculum, or the GEMs database, check out our webpage at: http://greenchem.uoregon.edu/. ■

Reference

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2. Reed, S. M.; Hutchison, J. E. Green Chemistry in the Organic Teaching Laboratory: An Environmentally Benign Synthesis of Adipic Acid. *J. Chem. Educ.* **1999,** 77, 1627–1629.
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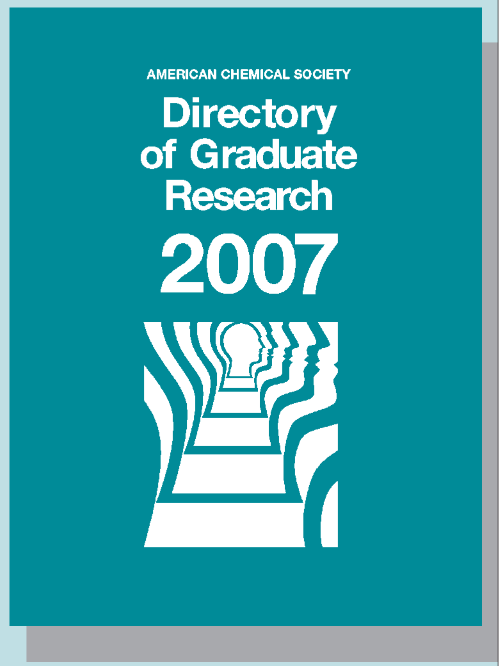
5. Anastas, P. T.; Warner, J. C. *Green Chemistry: Theory and Practice*. Oxford University Press: Oxford, U.K., 1998.
6. The Green Chemistry Education Network, established in July 2006, coordinates research and development activities at regional ambassador sites for the dissemination and implementation of green chemistry in education.

2007 Edition of the ACS Directory of Graduate Research

The **ACS Directory of Graduate Research (DGR)** is published in odd-numbered years, and it is again time to begin data collection for the 2007 edition. As with past editions, there will be two rounds of data submission for the 2007 directory, and both of these rounds of data collection will be done using Web-based forms.



The DGR has been an indispensable reference for all who are involved in graduate education in chemistry and related sciences for over 50 years. In order to provide the most complete and accurate information, it is crucial that department chairs involve their faculty in the review of their listings and make the necessary corrections, deletions, and additions. Please watch for the upcoming DGR correspondence and help us make this publication as complete and accurate as possible. If you have any questions related to the DGR project, please contact Marta Gmurczyk at m_gmurczyk@acs.org or 202-872-4599.