

Departmental Program Reviews Underway

Every five years, West Virginia requires academic departments to produce program reviews for both undergraduate and graduate degrees. The Department has begun this process, which begins with a detailed self-examination. Some of the major findings include the following: 1) 80% of our graduates go on to earn advanced degrees upon leaving Marshall, with roughly equal numbers pursuing degrees in the sciences and health care, 2) we have hired an incredibly talented group of new faculty who are already making a major difference in the Department, 3) the rate of scientific productivity of our students has increased dramatically over the past 5 years, and 4) we have highly supportive alumni. Our biggest weakness is, of course, a lack of adequate financial support from the state of West Virginia. Our reports may be found at http://www.marshall.edu/assessment/assesreport_progreviews.htm. The next step in the process is that these reviews are analyzed by individuals and committees from our dean to the president and Board of Governors. At the time of this writing, with one exception, all of the reviewers have recommended resource increases for our programs.

Focus on Retention

Chemistry is frequently thought of as a difficult subject and pass rates in our introductory course, CHM 211, suggest that is true for many students. We've always known that students' math skills affect the grades they will receive in CHM 211, but wanted to see what other factors in students' backgrounds affect their success. Not surprisingly, students with low ACT math scores (less than 20) struggle in CHM 211 as do students who didn't take a high school chemistry class. In addition, students who make "C"s in high school math and science courses also have trouble with freshman chemistry. In fact, we identified risk factors for groups of students whose pass rates in CHM 211 were 30% or lower. To help these students, we created a basic chemistry skills course, CHM 111, and over the past year through a series of modifications have been able to raise student success rates to almost 70%. If you have children or grandchildren who will be taking chemistry in the future, you might find the results of the studies interesting. Even if those children don't plan on attending Marshall, the results are consistent with what we hear from other universities and colleges. Full details are included in our annual assessment reports that may be found at the link provided earlier in this newsletter.

Student and Faculty Accomplishments

Rebecca Ragland (BS 2010) had her WV NASA graduate fellowship award to work in Scott Day's lab renewed. She is studying the development of an integrated microfluidic device for cargo transport using the Actin-Myosin system. Benjamin Woodworth (BS Biochemistry) and Aaron Bailey (BA Biology) received Undergraduate Research Fellowships from the NASA West Virginia Space Grant Consortium to work in Derrick Kolling's lab. Their projects are described elsewhere in this newsletter.

Three students co-authored research publications with faculty: Lonnie Berry (BS 2009) and Kimberly Zuspan (BS 2009) reported with Ken O'Connor on the development of a new organic instructional laboratory, and Erik Vint (MS 2011) described with Scott Day and Mike Norton the conjugation of dendrimers to DNA for robustly attached DNA monolayers. Bin Wang also published a book chapter this year.



Last March, Tiffany Bell (BS Biochemistry) presented her research with Leslie Frost and Menashi Cohenford (ISAT department) at Pittcon 2011 in Atlanta. Benjamin Woodworth (BS Biochemistry) and James Board (MS Chemistry) presented their work from the Kolling lab at the Midwest/Southeast Photosynthesis Meeting at Turkey Run State Park, IN, in November. Ben was awarded best undergraduate student poster and as part of the award, was provided the opportunity to give a talk on his research (photo above). In January, Laura McCunn's students Courtney Hatten (BS Chemistry), Kristen Keown (BS Chemistry), Allison Combs (BS Chemistry), and Sara Lilly (BS Biomedical Science) shared their work with state politicians and fellow scientists at the Ninth Annual Undergraduate Research Day at the Capitol. Ashley Litchfield (BS 2010), Dawn Nicholas (MS 2011), James Board (BS 2011), Benjamin Woodworth (BS Biochemistry), Derrick Fry (BA Secondary Education), Srinivasarao Thulluri (MS 2010), Joshua Hendrix (BS 2010), and Jacob Kilgore (BS 2009) coauthored presentations this year with Derrick Kolling, Mike Norton, Ken O'Connor, Bill Price, and Bin Wang. Mike Castellani, Laura McCunn, and Bin Wang also presented research without student co-authors. In all, more than 15 presentations at professional meetings originated from the Department in the past year.

John Hubbard was acknowledged for being one of the *Journal of Organic Chemistry's* top

To be
known as
one of
the top
undergraduate
and MS
programs
in the nation
by integrating
teaching
with research
experience.

reviewers. John is frequently asked to evaluate manuscripts upon which other reviewers cannot agree. Gary Anderson was inducted into Marshall University's John Marshall Society last May.

Laura McCunn Wins University Service Award



Laura McCunn was awarded the Faculty Member of the Year Award by Marshall University Greek Life. The award was presented at the Greek Awards in April

2011. Laura serves as the faculty advisor for the Delta Upsilon Chapter of Delta Zeta Sorority. As an alumna of Delta Zeta at Ohio Wesleyan University, her involvement in the sorority extends beyond the typical faculty advisor role. She participates regularly in chapter activities, monitors the academic progress of the chapter, and provides academic guidance to sorority members.

Derrick Kolling Receives Funding from Research Corp.

Derrick recently received a two-year, \$35,000 grant from the Research Corporation for Science Advancement. These awards are given to researchers at primarily undergraduate institutions in their first three years of appointment for projects having the potential to further fundamental scientific knowledge and lead to a long-term viable research program. Derrick will use his award to investigate the light-dependent assembly of the oxygen-evolving complex of photosystem II, which is the source of our atmospheric oxygen. The assembly process will be studied in phototrophs that grow in extreme temperatures (e.g. 65°C and 10°C) and compared to those that function optimally around room temperature. This will provide information about the oxidation states of assembly intermediates, the molecular identity of the activation energy barrier, and provide a more detailed overall mechanism. The oxygen-evolving complex has been used to generate bio-inspired catalysts that are abiotic and more amenable to fuel cell usage; the work described in Derrick's grant will allow further understanding of the system, with the goal of designing more efficient catalysts. Results from this work will soon be submitted to peer-reviewed scientific journals; two students in the Kolling lab, Benjamin Woodworth and James Board will be first authors of their respective papers.

WE ARE... **MARSHALL.**

ACS Project SEED Supports Local High School Students

Last summer the local ACS section received funding to support initiation of the Department's first Project SEED Program. Project SEED helps economically disadvantaged high school students expand their education and career outlook by spending eight weeks of their summer conducting hands-on research with scientists in academic, industry, and government research laboratories. Students received a fellowship award of \$2,500 for their efforts and a chance to receive a SEED college scholarship. This past summer we had two students in our program; Jessica Nicely worked with Dr. Scott Day on the development of a nanocargo transporting device and Tyler Smith worked with Dr. Mike Norton on forming a gold nanoparticle array on DNA origami. We fully integrated these high school student projects into our summer undergraduate research program to maximize the student's experience working in a research lab with peers. The program was a success and we have applied for funding again this year with the hope of expanding our program to include more students.



Pres. Kopp visits Alison Combs at our industrial poster session

Transitions

David Arigan our stockroom manager in the 1980's and again for the past few years accepted a lead position in the Receiving Department. We are currently searching for his replacement. Amanda Kolling, Derrick's wife, delivered a healthy baby boy in September.



Marshall University
Department of Chemistry
One John Marshall Drive
Huntington, West Virginia 25755

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