

Outside mentoring support for science faculty at minority serving institutions pays off ^[1]

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BETHESDA, MD—SEPTEMBER 4, 2013—A matched-peer controlled study of science faculty at minority-serving institutions (MSI) shows that an outside mentoring support program increased the number of peer-reviewed research publications, the number of federal grants, and the variety of professional and curricular activities of those who participated versus academic peers who did not.

The study, published today in the journal, *CBE-Life Sciences Education*, looked at outcomes from the Visiting Professorship (VP) Program, organized by the Minorities Affairs Committee (MAC) of the American Society for Cell Biology (ASCB) and funded through a Minority Access to Research Careers by the National Institute of General Medical Sciences (NIGMS), a component of the National Institutes of Health (NIH). Limiting the group to the 32 participants who were at least one year beyond their first involvement in the program, VP participants increased their average number of scientific publications from .84 to 1.37. The average number of research papers

published by the 129 peer controls who were matched for academic rank, home institution, and home department, declined from .85 to .82, The VP participants increased the average number of new federal grants from .06 to .59 versus .03 to .16 for the peer controls. Twenty-two of the 32 VP participants also reported significant increases in academic activities that are strong indicators of professional advancement including collaborating on research, developing new or reworking current courses, drawing students into research projects, taking on new leadership roles, attending scientific meetings, and joining scientific societies.

"This is one of a handful of evaluation studies that I've seen," said ASCB Executive Director Stefano Bertuzzi, PhD, "which rigorously proves with a control that minority training programs can work. Diversity in the scientific workforce is not a 'some day' goal but a necessity if American science is going to prosper in the mid-21st century. This rigorous study shows real and significant results from the Visiting Professor Program, which the ASCB has nurtured for over 15 years. It offers hard evidence that we can make a difference in minority-serving institutions."

"Our paper makes the point that the question is no longer, 'What is achievable at minority serving institutions?' – it's laid that question to rest," says the paper's first author, Andrew G. Campbell, PhD, of Brown University. "Simply put, the paper shows that given adequate time, material resources and human support—any motivated faculty can translate on their academic vision and potential. It also shows the power of partnerships —something that NIH recognizes as it has recently launched a number of initiatives through its Common Fund."

ASCB MAC chair Renato Aguilera, PhD, says, "This paper underscores a key goal of the ASCB MAC--to invigorate the research interests of science faculty at MSI's where positions are typically teaching-intensive. The updated research skills that Visiting Professors learn while working with their scientific hosts impacts their students back home by 'seeding' new research programs at MSI's." Aguilera who is at the University of Texas, El Paso, continues, "Doing real research is the critical element in forming a scientific identity in students and this paper shows that the continued support by the NIH/NIGMS for the Visiting Professors and other ASCB MAC programs has had a strong positive effect."

The VP program sought out life sciences faculty members at minority-serving institutions because this is where an increasing percentage of America's underrepresented minorities in science—African-Americans, Hispanics, Asians and Native Americans—are turning for undergraduate education and training. Despite decades of desegregation and affirmative action, the percentage of U.S. minority students who attend a MSI actually increased from 13.5% in 1984 to 32% in 2004. Among African-American college students, for example, 58% were enrolled in an MSI in 2004. Among Hispanics, the percentage was 63.3. The study led by Campbell and David Asai, PhD, of the Howard Hughes Medical Institute, point to a warning in a 2011 National Academy of Sciences report that the low percentage of American minorities in the STEM professions would likely impede U.S. scientific progress over time. The best way, the authors argue, to improve STEM education for minorities right now is to improve the professional development of MSI science faculty. The best way to do that is show them how to conduct "inquiry-based learning" through research-based laboratory courses.

For the VP Program, the faculty members themselves did not have to be from minority groups, only that they taught at a MSI. The resulting study group of 32 VP Program participants included

19 African Americans, four Asians, three European Americans, and six Hispanics. Nineteen were women. Faculty positions at MSIs tend to be teaching heavy and research light. Advanced equipment is in short supply as are consumables, model organisms, and dedicated research space.

The VP Program paired these MSI faculty with host scientists at research-intensive institutions for 8-10 week training internships. The host scientists were largely accomplished scholars with major research credits, long graduate teaching experience, and well supported research programs. Beyond immersion in discovery science, the VP participants were also involved in career development workshops, scientific meeting presentations, and the difficult art of writing papers and grant proposals. "It is likely that the effectiveness of the VP Program is due in no small part to the program being one of a suite of opportunities offered to these scientists," the authors concluded.

The authors describe their study as only a first step in bringing scientific analysis to the educational and cultural problem of creating a diverse scientific work force in the U.S. The VP Program offers value for money, they point out. Over the 15 year life of the program the annual cost per participant has been roughly \$6,000, although VP Program also relies on the generosity of the host scientists to take on a Visiting Professor and the willingness of their home institutions to allow them to take part. Yet it is the personal scale of the VP Program, the researchers conclude, that seems the key to success. "The patient, often person-by-person investment in faculty development promises to ultimately translate into educational gains that benefit the larger scientist community in terms of scientific productivity and workforce development."

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Media contacts:

John Fleischman
Senior Science Writer, ASCB
(Cell) 513-706-0212
jfleischman@ascb.org ^[2]

David Orenstein
Science News Officer
Medicine, Life Sciences and Public Health
Brown University
O: 1-401-863-1862
M: 1-401-527-2525

Author contact:

Andrew G. Campbell
Brown University
401-863-2532 (messages)
andrew_campbell@brown.edu [3]

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Campbell AG, Leibowitz MJ, Murray SA, Burgess D, Denetclaw WF, Carrero-Martinez FA, Asai DJ (2013). Partnered research experiences for junior faculty at minority-serving institutions enhance professional success. *CBE Life Sci Educ* 12, 394.

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