



No “finish line” for diversity in US STEM workforce

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Hannah Valentine, the chief officer for Scientific Workforce Diversity at the US National Institutes of Health, learned that “organ transplant recipients from non-European ancestry do a lot worse than any other group.” Speaking at a roundtable discussion on diversity hosted by the US National Academy of Sciences (NAS) in Washington, DC, last spring, she said such revelations are made due to a diverse population of researchers who are asking the questions. Bringing in researchers with different points of view enables solutions to improve health treatment for underrepresented groups, she said. Furthermore, Valentine said, the broad population benefits as research “moves toward precision health”; which, incidentally, is an effort that also involves the physical sciences.

NAS fostered a dialogue about the importance of workforce diversity in the science, technology, engineering, mathematics, and medical fields in their event, “STEM Workforce Diversity: Where Do We Go from Here?” held on March 21, 2019. The panelists agreed, first and

foremost, that a diversity of people leads directly to a diversity of ideas—and a diversity of ideas leads to better results.

“No [particular] demographic is more important than another when it comes to workplace contributions and success,” according to Sonia Zárate, president of the Society for Advancement of Chicanos/Hispanics and Native Americans in Science. This was echoed by panelist David J. Parrillo: “Inclusivity leads directly to increased profitability.”

Parrillo is Vice President of R&D Industrial Intermediates and Infrastructure at Dow, including the businesses of Polyurethanes, Construction Chemicals, and Industrial Solutions. He said that many studies have shown that some of the most profitable corporations in the world are also the most diverse companies in the world.

If a diverse STEM workforce is beneficial, then what are the barriers to increasing diversity, and particularly at all professional levels, from staff to leadership in the academic, industrial,

and government sectors? The concept of white male privilege is one barrier, according to Richard Lockwood, vice president of Lockheed Martin’s Rotary and Mission Systems Business Performance organization—the idea that white males in particular have advantages of being hired and retained in the sciences. Lockwood said less diversity is seen in middle management due to undeliberate hiring biases. “They worked hard to get to where they are so they don’t believe they’re privileged,” said Lockwood.

Based on the success record at Dow, Parrillo offered numerous examples of “how to move the needle.” When a middle management team interviews candidates for a new position, “that panel has to look like what I want the company to be.” If the hiring team lacks the desired diversity, they can reach out to other departments in order to build the hiring team they need. Parrillo said, “This should be the way we work, the way we think.”

Panelists from US government agencies described utilizing targeted programs to bring in researchers from underrepresented groups. Sylvia M. James, deputy assistant director of the National Science Foundation’s Directorate for Education and Human Resources, emphasized the importance to “spread the word” and encourage researchers to take advantage of these programs “so that we can max out the number of—whether they’re fellowships, internships, opportunities for research, postdoctoral opportunities—to raise awareness of what already exists in the federal structure.”

James pointed to the importance of the need for “everyone” to apply to the broader programs. This was also a key message from Under Secretary for Science Paul M. Dabbar. “The demographically targeted programs are useful to bring people in and know they’re welcomed so that they’ll then apply to the broader programs,” he said. To help researchers further recognize “inclusivity,” Dabbar pointed to the importance of “transparency of who we are and what backgrounds we have, so potential candidates can see the various backgrounds.”

There is no “finish line” when it comes to increasing diversity in terms of



Photo credits: Dow.

gender and ethnicity in the STEM workforce. Too often, employers and human resource departments establish targets for the hiring of women and minorities and once the target is reached, consider these efforts a success, when in fact diversity should be viewed as a permanent endeavor for employee recruitment and retention efforts. Valantine said, in her agency, “each department chair has to report on the constant monitoring of different programs.”

Parrillo stated that Dow analyzes job descriptions to see what terminology might be deflecting certain applicants. They also have a sponsor program, which is different from mentorship. Sponsors “champion their sponsee—their sponsee’s ideas, cultural background, job opportunities—because they believe in the sponsee and their advancement in the company.”

Valantine pointed to the importance of creating a work environment that values work/life balance, particularly to address life-changing situations like pregnancy. In academia, James said that “programs are needed to help institute a career path,” particularly to address the networking that is gained or lost after a leave of absence. Parrillo agreed, saying the “work environment has to be cultivated” to include conversations about life-change situations, where employees can talk openly to examine their career options.

In terms of next steps, Parrillo—who serves as treasurer for the Materials Research Society—recommended that participants from various sectors create an ad hoc group to share best practices and innovative ideas that have worked in their respective workplaces. Moving forward, it

is important to “identify allies and champions of diversity efforts and allow them to share what has worked for them with larger communities,” said Parrillo.

This event was held as part of the NAS New Voices Program sponsored by the Gordon and Betty Moore Foundation. The moderators were Vaughan Turekian, executive director for Policy and Global Affairs at NAS; Patricia Silveyra, associate professor and director of the Biobehavioral Laboratory and Beerstecher-Blackwell Distinguished Term Scholar at the University of North Carolina at Chapel Hill; and Olujimi A. Ajijola of the University of California, Los Angeles, Cardiac Arrhythmia Center, Neurocardiology Research Center, and David Geffen School of Medicine.

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Europe’s “Hydrogen Valleys” set blueprint for sustainable hydrogen market mission-innovation.net

Hydrogen is expected to become one of the building blocks of a low-carbon economy. Its use has recently gained momentum with multiple initiatives launched across the globe. Last fall, 28 European countries signed a “Hydrogen Initiative” calling for intensification of sustainable hydrogen research and innovation. Over 80 representatives from government, industry, and the research community met in Antwerp last March for a two-day workshop on “Hydrogen Valleys,” held by the Innovation Challenge 8: Renewable and Clean Hydrogen (IC8), a program of Europe’s Mission Innovation initiative. At the workshop, the concept of “Hydrogen Valleys” was discussed as a blueprint for scaling up the sustainable hydrogen market.

A “Hydrogen Valley” is a geographical area—a city, a region, an island, or an industrial cluster—where several hydrogen applications are combined into an integrated hydrogen ecosystem that consumes a significant amount of hydrogen, improving the economics behind the project. It should ideally cover the entire hydrogen value chain: production, storage, distribution,

and final use. As such, “Hydrogen Valleys” offer a pathway for scaling up and making this technology a viable solution.

At the same time, “Hydrogen Valleys” are extremely important for showcasing, to decision makers and to the public, the unique value hydrogen offers in the broader energy system context through its sectorial integration capability. Although many demonstration projects have successfully shown the maturity and benefits of individual hydrogen technologies, typically either in isolation or in a limited size, the potential of hydrogen as an integrated systemic solution has not yet been proven at scale.

However, replication is not straightforward when it comes to “Hydrogen Valleys” as there is no “one size fits all” solution. Different countries have different circumstances, especially in terms of their economic, geopolitical, and environmental situations as well as the available infrastructure base. The transition to a hydrogen economy requires different answers depending on location. This is why the participants of the Hydrogen Innovation Challenge decided to share their experiences in order to de-risk and facilitate

the emergence of new integrated hydrogen projects in support of their countries’ policy priorities.

At the Antwerp workshop, a number of case studies were presented, as were multiple project types from industry-driven clusters, to ports, communities and regions with abundant renewable energy or those under pressure to tackle air pollution issues, to mining sites or knowledge-driven communities. The workshop confirmed that although projects are very specific to local circumstances, there is room and readiness to exchange experiences, best practices, and lessons learned. Specific areas for cooperation include business models, regulatory obstacles, permits and certification, standards, technology assessments, and mapping of major existing and planned R&D projects in areas most relevant for “Hydrogen Valleys.”

As a follow-up, the IC8 members plan to next work on establishing an information-sharing platform. This platform will leverage, consolidate, and disseminate existing knowledge and support building of global alliances around “Hydrogen Valleys.” The EU will initially host and finance this platform through its Fuel Cells and Hydrogen Joint Undertaking program. □