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NEWS RELEASE

Immediate Release

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BIOSCIENCE EDUCATION STUDY FINDS SOME STATES LAGGING

First-ever report by Battelle, BIO and Biotechnology Institute find wide disparities in achievement and uneven program efforts

Atlanta, GA— States across America are failing to prepare students for pursuing biosciences in higher education—a key pipeline for developing the bioscience workforce of the future. A new report funded and researched by BIO, Battelle, and the Biotechnology Institute provides the first ever comprehensive study of middle and high school bioscience education in the 50 states, Puerto Rico, and the District of Columbia. The report also finds a wide disparity across measures of student achievement in overall science and biosciences, an uneven record across states in incorporating the biosciences in state science standards, supporting focused bioscience education programs and higher level bioscience courses, and ensuring science and bioscience teachers are well qualified.

The findings, which came to light at BIO's annual convention, indicate a clear need for improved science education that incorporates the biosciences at the middle and high school levels if the United States bioscience industry sector is to remain globally competitive.

"The biosciences are a dynamic economic driver with a sizable footprint in nearly every state," explains James Greenwood, President of BIO and member of the Board of the Biotechnology Institute. "The bioscience industry is a knowledge-based sector dependent upon the skills of its workers. Bioscience workers are needed to conduct research, translate innovation into product development and improved health care techniques, and ultimately to manufacture biomedical and other bioscience-related products. The prospect of the United States losing its competitive edge in student achievement and the subsequent skills of our future workforce is a matter of significant concern."

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This is not to say that bioscience education is non-existent in the United States because there are many examples of programs that work. However, the report does say that these programs should be replicated across the country and that states need to commit resources to them.

“The biosciences are the great adventure of our time, and states that aspire to play a part, either as supporters or leaders, must nurture their life science education programs," says Paul A. Hanle, president of the Biotechnology Institute. "This report rates the states' performance in life science education according to certain indicators of achievement. It also identifies best practices and programs throughout the nation. Both will be vital tools to help states wanting to strengthen their life-science education efforts."

This review of state activities in bioscience education suggests a number of actions that should be taken. For example, individual states:

- Should incorporate biotechnology as they revise their science standards and should involve research scientists with expertise in the biosciences in their development.
- Must commit to improving student achievement in biology and the life sciences and ensuring that their high school graduates are ready to pursue college-level bioscience courses.
- Should improve the collection and dissemination of data, tracking student participation and performance in the biosciences and the broader sciences and if they do not participate in the National Assessment of Educational Progress (NAEP) science exam should be encouraged to do so.
- Should take a more systematic approach to teacher professional development, experiential learning, and career awareness.

“The study recognizes the important link that high schools and middle schools have as the primary feeders to post-secondary institutions and in shaping career preparation,” explains Mitch Horowitz, Vice President and Managing Director of the Battelle Technology Partnership Practice. “The vast majority of bioscience jobs require some level of post-secondary education to ensure quality control and good manufacturing practices, conduct clinical research, design and engineer new products, or conduct research and development.”

The report provides the following evidence that states are not measuring up:

- On average, only 28% of the high school students taking the ACT , which is a national standardized test for college admission, reached a score indicating college readiness for biology and no state reached even 50%.
- Only 52% of 12th graders are at or above a basic level of achievement in the sciences, and for 8th graders only 57% are at a basic level of achievement.

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- Average scores for 12th graders in the sciences have actually declined from 1996 to 2005 and shown no improvement for 8th graders both overall and on the life science component.
- A significant gap exists in science achievement for low-income middle-school students, although the gap is slowly narrowing.

Some states fared much better than others with respect to student achievement in the biosciences. While it is difficult to give a single grade across states because of the limited quality and comparability of the student achievement data, the patterns of student performance suggest the states fall into several broad categories.

- **Leaders of the Pack:** Connecticut, Massachusetts, Minnesota, New Hampshire, New Jersey, Ohio, Vermont, Wisconsin
- **Second Tier:** Colorado, Delaware, Illinois, Maryland, Missouri, North Carolina, North Dakota, Oregon, Rhode Island, South Dakota, Tennessee, Utah, Virginia, Washington
- **Middling Performance:** Alabama, Arizona, California, Hawaii, Indiana, Kentucky, Maine, Michigan, Montana, South Carolina, Wyoming
- **Lagging Performance:** Arkansas, Florida, Georgia, Louisiana, Mississippi, Nevada, New Mexico, Oklahoma, Texas, West Virginia
- **Not Rated:** States that do not participate in the NAEP science assessment were not rated.

The report also finds an uneven record across states in incorporating the biosciences in state science standards, supporting focused bioscience education programs and advanced bioscience courses, and ensuring well-qualified science and bioscience teachers.

Only thirty-one states reported that their science standards explicitly mention or define standards or applied laboratory or other instruction tools specifically for biotechnology or the biosciences.

At least half the states have at least one school with a bioscience focus, and all of the states have schools with a focus on broader STEM education. But states do not seem to be succeeding in encouraging high school students to take upper-level science courses. Although data on this subject are very limited, the share of students taking the AP biology exam averages 4.6% of high school graduates.

The report also notes that nearly one in eight U.S. high-school biology teachers was not certified to teach biology. The average share of biology teachers who are certified in a given state ranged from 50% to 100% in data collected by the Council of Chief State School Officers (CCSSO), although 88% of biology teachers are certified nationally on average.

There are a variety of ways to see the results of the study. To access a copy of the report, an executive summary or presentation about the findings, go to one of the following addresses: http://www.battelle.org/news/pdfs/BioEd_09Summary_report.pdf;

http://www.battelle.org/news/pdfs/Exec__BioEd_09Summary_report.pdf;

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http://www.battelle.org/news/pdfs/BioEducation2009_v3.pdf;

http://www.biotechinstitute.org/programs/educationreport.html; or

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The Biotechnology Institute is dedicated to educating teachers, students, and the public about the promise and challenges of biotechnology. Through year-round programs, the Institute is creating a base of understanding and awareness about biotechnology among teachers and students—and building the next generation of leaders in the industry. Founded by the biotechnology community in 1998, the Biotechnology Institute is an independent, national nonprofit organization based in Arlington, VA.

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