

DIVERSITY

PhD completion rates

In the hope of boosting degree completion rates, the US Council of Graduate Schools (CGS) in Washington DC is to examine attrition of minority students in science, technology, engineering and maths (STEM) programmes. The CGS will analyse data from 21 public and private universities for those entering programmes between 1992 and 2012. It aims to visit sites and interview students, faculty members and administrators to identify impediments to completion, and develop tools to remove them. Previous studies found that completion rates of minority students for STEM PhDs were significantly lower than those of non-minority students, notes Robert Sowell, vice-president for programmes and operations at CGS.

UNITED STATES

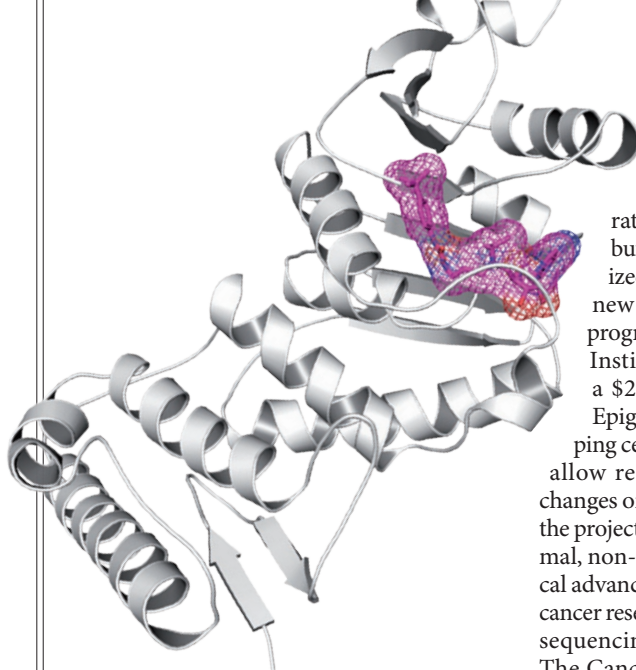
Unions banned

Michigan Governor Rick Snyder has banned graduate-student research assistants in public universities from unionizing following the efforts of 1,200 students to organize a union in April 2011. Snyder said in a statement that research assistants are students and giving them public-employee status and union representation would alter the student-teacher relationship. This is the latest action against US graduate-student unions. In 2004, New York University's union was disbanded under a state labour-board decision. Student representatives from Michigan State University in East Lansing and University of Michigan in Ann Arbor did not respond to interview requests.

PARTNERSHIPS

Postdoc opportunities

The California Institute for Quantitative Biosciences (QB3), part of the University of California, will hire up to 15 postdocs in a collaboration with drug firm Pfizer that expands a 2009 agreement to discover and develop technologies and drugs. Postdocs will be funded for two years in areas such as cardiovascular disease, immunology, neuroscience and oncology. They will learn to work with industry, says QB3 director Regis Kelly, who notes that this is a key activity given that many will go on to seek industry positions. Pfizer contributed US\$9.5 million to the original partnership and will provide at least the same level of funding again, says Ron Newbold, Pfizer's vice-president for strategic research partnerships.



An example of one of Epizyme's inhibitors interacting with an epigenetic enzyme.

► Cancer Institute (NCI) in Bethesda, Maryland, has several programmes dedicated to epigenetics, including the Epigenetic Approaches in Cancer Epidemiology programme, which funds about 30 projects at a total of \$45 million. In 2011, the US National Institute of Environmental Health Sciences awarded about \$11 million in grants for epigenetics-related research. The institute has a strong interest in the environment's effect on epigenetics and how that influences diseases such as cancer, notes Edward Kang, a spokesman for the institute, which is based in Research Triangle Park, North Carolina.

Government investment has also fuelled the shift to large, genome-wide epigenomics studies. In October 2011, the European Commission launched its €39.9-million (US\$52.1-million) BLUEPRINT project, which brings together 41 institutes and companies to generate at least 100 reference epigenomes from healthy and leukaemic cells. Just over €2 million of that is still to be doled out, says project coordinator Henk Stunnenberg of Radboud University in Nijmegen, the Netherlands. The project's team hopes to recruit at least five more groups from academia and industry. The European Commission support of epigenetics research helped to woo Manel Esteller, an epigenetics researcher at the Bellvitge Biomedical Research Institute in Barcelona, Spain, back to his home country from the United States. Esteller now participates in the BLUEPRINT project and coordinates CURELUNG, another programme funded by the European Commission, which unites 11 institutions and companies and has analysed DNA methylation in nearly 1,000 human lung tumours thus far. "The European Commission offered the opportunity to apply for different grants that were able to complement local funding," he says. "This extra help has been critical in the success of my projects."

Many of the biggest investments in

epigenomics directly fund the larger sequencing centres rather than individual investigators, but smaller laboratories have capitalized on the steady stream of data and new technologies emerging from the programmes. In 2008, the US National Institutes of Health (NIH) launched a \$200-million, ten-year Roadmap Epigenomics Project to develop mapping centres and technologies that would allow researchers to survey epigenetic changes on a genome-wide scale. Although the project focuses on the epigenetics of normal, non-cancerous tissue, the technological advances and large data sets have helped cancer research as well. Many cancer genome sequencing projects, including the NCI's The Cancer Genome Atlas (TCGA) programme, include a partial focus on cataloguing epigenetic changes. Kenna Shaw, director of the TCGA programme office in Bethesda, says that the programme has funded around 200 jobs. The bulk of the funding for these large-scale programmes is already dedicated to the larger sequencing centres, but smaller teams are using the data from these projects to generate individual-investigator grant applications, Shaw adds.

These data have helped to persuade investors in industry that epigenetic abnormalities in cancer could provide a wealth of new drug targets. The finding that mutations in epigenetics-related genes may be driving some cancers offers the tantalizing possibility of taking a personalized approach to cancer treatment, a tack that is rapidly gaining



Personalized treatment for cancer is rapidly gaining ground in industry.

Robert Gould

ground in industry, says Robert Gould, chief executive of Epizyme, an epigenetics focused biotechnology firm based in Cambridge, Massachusetts. This evidence, plus the successful approval of a first generation of drugs intended to target epigenetic pathways, has convinced almost every major drug company to invest in cancer epigenetics, says Mukesh Verma, a programme officer at the NCI. For example, Novartis, a pharmaceutical firm with its headquarters in Basel, Switzerland, has more than 200 employees working in epigenetics, most of them in cancer, says En Li, head of China Novartis Institutes for Biomedical Research, based in Shanghai. Last year, GlaxoSmithKline in London, in addition to funding its own epigenetics team, paid \$20 million to partner with Epizyme in a deal