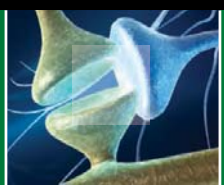
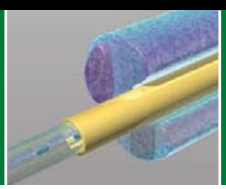


Energy budgets in the brain

1349



Signaling in myelin formation

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believe in our approach. Of course, biology needs to be inquiry-based, but to teach it in a physical science vacuum is counterproductive.

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## Purposeful Learning with Drug Repurposing

HIGH-THROUGHPUT SCREENING (HTS) OF comprehensive approved drug libraries has revealed new uses for old drugs (*1*, *2*). Although repurposing of drugs has been used for decades at the discretion of physicians (*3*), the Policy Forum "Repurposing with a difference" by M. S. Boguski *et al.* (12 June, p. 1394) describes a revolutionary approach to research and development in the drug industry that uses "repurposing pharmacovigilance" to find novel beneficial effects of drugs rather than adverse effects. This is a systematic approach that integrates new business models, patient-as-consumer activism through online social networking, information technology, and genomics as powerful tools.

As educators at the undergraduate and graduate levels, we believe that "repurposing pharmacovigilance" offers an innovative and relatively inexpensive interdisciplinary learning approach that can be used to engage students across the sciences and medicine as well as business and the humanities. Through analysis of case studies, students can learn about neglected diseases from a scientific and public policy point of view. Student project teams can work together in the classroom or laboratory to explore statistical data mining with the use of patient advocacy Web sites such as Resounding Health, pharmacological data, or analysis of HTS results from drug libraries to reveal new repurposing applications. Budding scientists trained in rights-based approaches would not limit themselves to drug development but would strive toward the availability of a public health structure, accessibility of these innovations, and acceptability by the users as well as the high quality of drugs (*4*). The scientific and ethical questions that evolve for discussion and debate around developing and providing these drugs to the target population will prepare the next generation of scientists and physicians for meeting the new challenges of unmet medical needs that lie ahead. Ultimately, patients will benefit from a more efficient drug discovery process that relies on complementary, not conflicting, scientific and human rights principles.

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## Taking Educational Research to School

THE 17 JULY REVIEWS BY A. N. MELTZOFF *ET al*. ("Foundations for a new science of learning," p. 284) and J. D. E. Gabrieli ("Dyslexia: A new synergy between education and cognitive neuroscience," p. 280) summarize the enormous progress that has been made in understanding the behavioral and neurobiological bases of learning and dyslexia, respectively. What is remarkable is how little of this research has penetrated educational practice. Teachers are not exposed to this research as part of their training. I often speak with teachers who are surprised that a science of reading exists, not to mention a science of learning linking brain and behavior. Educational theories rely on the work of a small number of psychologists (such as Lev Vygotsky and Jerome Bruner) whose research predates the modern era in cognitive neuroscience. In the case of dyslexia, many school systems do not even recognize that the condition exists. Parents of dyslexic children are routinely told that a child who can speak should be able to read, that the parents have not encouraged reading enough in the home, or that "dyslexia" reflects the medicalization of normal variation. The approximately 25% of American 8th graders who read below even the basic level (*1*) includes many dyslexics who have not been identified in the schools and provided with appropriate remediation. It is admirable that the authors attempted to spell out the educational implications of the research. Whether the educators are prepared to act on this information, or even understand it, is another question. The institutional and ideological barriers to linking science and education are substantial, as are the costs to society.

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1. National Assessment of Educational Progress (2007); http://nationsreportcard.gov/reading_2007/r0003.asp.

## United States Acting to Conserve Tuna Stocks

THE NEWS OF THE WEEK STORY "PROTECTING the last great tuna stocks" (C. Pala, 29 May, p. 1133) contains errors regarding the position and actions of the United States with respect to tuna conservation in the Pacific Ocean. In particular, the United States does not claim any exemption from applicable conservation and management measures and is currently developing the regulatory framework to implement all measures adopted by the Western and Central Pacific Fisheries Commission (WCPFC). Nor does the U.S. fleet fish "without limits" in the waters of the Pacific Island







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