BIOMEDICINE

Fishin' for Answers

Tumors that remain spatially confined are usually treated more effectively than those that disseminate to other parts of the body. Thus there is great interest in identifying the molecular signals that control tumor cell dissemination in order to reveal new therapeutic targets. The related cancers T-lymphoblastic lymphoma (T-LBL) and acute T-lymphoblastic leukemia (T-ALL) are intriguing examples because despite their genetic similarity, T-LBL develops as a localized disease in some patients, whereas in others the disease progresses to T-ALL and spreads rapidly.

To explore the molecular basis for this, Feng *et al*. studied T-LBL development in zebrafish, a model organism in which genes of interest can be readily manipulated and the effects of these manipulations are easily monitored because the fish are transparent. Spatially confined T-LBL showed activation of intercellular adhesion signaling pathways that prevented invasion of the tumor cells into blood vessels. The genes implicated in this process encoded BCL-2, S1P1, and ICAM1, which interestingly were expressed more highly in clinical samples of T-LBL as compared to T-ALL. Conversely, T-LBL that progressed to T-ALL exhibited activation of the protein kinase AKT. Patients with T-LBL and T-ALL often receive identical treatments; however, this work suggests that patients may benefit from therapies that target the distinct molecular features of their cancers. — PAK

Cancer Cell **18**, 353 (2010).

IMMUNOLOGY

Two Are Better than One

Two hallmarks of antibody recognition are high binding affinity and the ability of the two antibody arms to bind copies of the same region of an antigen. Eliciting broadly neutralizing antibodies by vaccination is a key therapeutic goal in fighting HIV. One conundrum, however, is that a critical HIV antibody target, the viral spike (gp140), is found at a relatively low density on the viral surface, and so the ability of an antibody to bind gp140 with both arms is unlikely. Such monovalent binding would probably lead to less-effective viral neutralization. To better understand antibody binding to gp140, Mouquet *et al.* analyzed 134 distinct neutralizing gp140 antibodies and found that 75% of these were polyspecific, in contrast to 17% of control antibodies. They found that these polyreactive antibodies were able to bind gp140 with high affinity and also to a second viral structure with low affinity. B cell development favors the production of antibodies with a single specificity; thus, one explanation for why broadly neutralizing antibodies are so hard to elicit in response to HIV may be because polyreactive antibodies are relatively rare. — KLM

Nature **467**, 591 (2010).

EDUCATION

Wikipedia Goes to Grad School

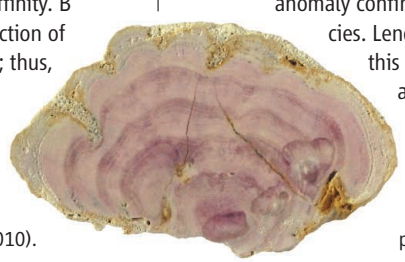
Very few graduate-level science curricula include training in communicating advanced concepts to a general audience. Moy *et al.* report a class project that addressed this by having chemistry students edit an entry in Wikipedia.org collaboratively. Students selected topics that were related to the course and were minimally covered on Wikipedia. Student entries contained references, an introduction aimed at the general public, and figures to enhance the explanation of the topic. Student feedback collected at the end of the project revealed increased knowledge of their topic. A specialist in writing and rhetoric concluded that the students' entries were more engaging to general readers because of the attention to real-world applications and clear explanations of vocabulary. Course professors noted that students appeared to assess the material they added to the entry more critically than when they were simply studying for the class, which is consistent with the notion of students' developing a higher level of explanatory knowledge when teaching the material is a goal. — MM

J. Chem. Educ. **87**, 1159 (2010).

CHEMISTRY

Buried Boron

Certain classes of organic molecules, or biomarkers, can provide clues that are otherwise absent or unexpected from examinations of the physical structure of fossil specimens. Case in point: In seeking to identify the biomolecules responsible for the magenta-colored bands in fossils of calcareous red algae, Wolkenstein *et al.* happened upon a previously unseen class of boron-containing pigment, or borolithochrome. The low levels of boron in the surrounding sediments and the specific chirality of the pigment suggest that the structural boron occurred in the living algal cells. The bands in all of the *Solenopora jurassica* samples studied, from several localities in France and the United Kingdom, receive their coloring from this unusual pigment, demonstrating its stability and relatively wide occurrence. Because this borolithochrome has been observed only in *S. jurassica* fossils, it is possible that it is a biological anomaly confined to this ancient species. Lending further support to this hypothesis is the lack of any similar biomolecules in any known extant organisms. — NW



Proc. Natl. Acad. Sci. U.S.A. **107**, 10.1073/pnas.1007973107 (2010).