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In This Issue

BIOCHEMISTRY

An unusual selenoprotein family

Sergi Castellano *et al.* have identified a family of selenoproteins, the SelJ family, found only in fish and sea urchins. Using multiple computational methods, the authors screened the recently released genome of the green puffer fish (*Tetraodon nigroviridis*) for proteins containing selenocysteine. They identified members of 19 known eukaryotic selenoprotein families, as well as a previously unreported gene, *SelJ*. Unlike most selenoproteins, which have broad phylogenetic distribution, SelJ was present only in fish and sea urchins and may have an enzymatic function related to ADP-ribosylation. The closest homologs to SelJ are the J1-crystallin eye lens proteins of jellyfish, suggesting that, in contrast to the majority of strictly enzymatic selenoproteins, SelJ may have a structural role. Castellano *et al.* provided evidence for this possibility by showing that in zebrafish *SelJ* is predominantly expressed in the eye lens and neural crest in early embryonic development. These unusual properties of SelJ selenoproteins reveal the diversity and plasticity of this protein group. — N.Z.

SelJ gene expression in zebrafish embryo 48 h after fertilization.

"Diversity and functional plasticity of eukaryotic selenoproteins: Identification and characterization of the SelJ family" by Sergi Castellano, Alexey V. Lobanov, Charles Chapple, Sergey V. Novoselov, Mario Albrecht, Deame Hua, Alain Lescure, Thomas Lengauer, Alain Krol, Vadim N. Gladyshev, and Roderic Guigó (see pages 16188–16193)

GENETICS

Identifying apoptosis-associated p53 polymorphisms

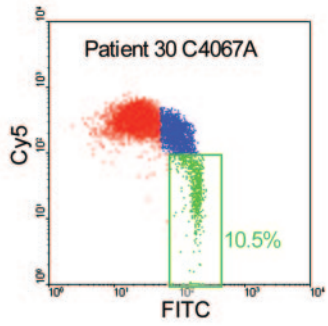
Sandra Harris *et al.* describe a method to identify SNPs in the p53 tumor suppressor pathway that could improve assessment of cancer risk. SNPs in the p53 pathway are believed to impart susceptibility to cancer, but efficient methods for analyzing the thousands of SNPs within this pathway have been lacking. To aid in identifying cancer-associated SNPs, Harris *et al.* developed a technique to assess an individual's sensitivity to γ radiation, a potent promoter of apoptosis. The authors exposed human B-lymphocyte cell lines from 120 individuals to γ radiation and measured the apoptotic response of each line. A heterogeneous distribution of responses was observed, ranging from 12% (low responders) to 58% (high responders). These responses correlated with race, with Caucasian donors among the lowest responders and African-American donors the highest. In addition, the low responders harbored specific SNPs within the AKT1 gene, an antiapoptotic protein kinase, conferring resistance to radiation-induced apoptosis. The results suggest that individuals with a low apoptotic response to radiation may show a decreased responsiveness to chemotherapy and may have a higher risk of developing cancer. — M.M.

"Detection of functional single-nucleotide polymorphisms that affect apoptosis" by Sandra L. Harris, German Gil, Harlan Robins, Wenwei Hu, Kim Hirshfield, Elisabeth Bond, Gareth Bond, and Arnold J. Levine (see pages 16297–16302)

MEDICAL SCIENCES

Noninvasive detection of colon cancer genes in blood

Frank Diehl *et al.* report the development of a blood test to detect and quantify mutations in colon cancer genes at early stages of progression. Although many cancers, including those of the colon, may be curable if detected early, the lack of sensitive, noninvasive screening tools for early-stage cancers has limited progress in diagnoses. Diehl *et al.* modified a technique the group had previously developed to measure minute quantities of mutant DNA molecules coupling to beads and counted via flow cytometry. The authors measured total circulating levels of normal ver-



Example of flow cytometric profile of beads generated from patient plasma DNA.

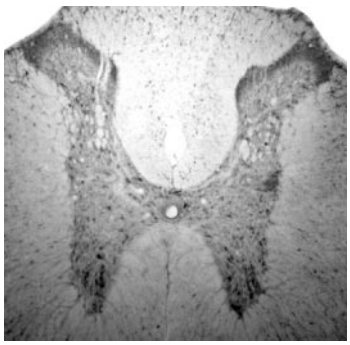
sus mutant adenomatous polyposis coli (APC) genes in 33 patients with colorectal tumors and 10 age-matched donors without tumors. Markedly elevated levels of mutant APC genes were observed in the blood plasma of patients with advanced-stage colorectal cancers and detectable levels of mutant genes in >60% of patients with early-stage cancers. These results may provide a foundation for a colorectal cancer screening tool for presymptomatic, at-risk populations, which could also be adapted for other cancer types for which no presymptomatic screening tests exist. The results also offer clues as to the mechanisms through which tumor DNA is released into the circulation. — M.M.

"Detection and quantification of mutations in the plasma of patients with colorectal tumors" by Frank Diehl, Meng Li, Devin Dressman, Yiping He, Dong Shen, Steve Szabo, Luis A. Diaz, Jr., Steven Goodman, Kerstin A. David, Hartmut Juhl, Kenneth W. Kinzler, and Bert Vogelstein (see pages 16368–16373)

MEDICAL SCIENCES

Antagonistic effects of spinal injury treatments

Alfredo Gorio *et al.* illustrate that suppression of the inflammatory response alone is not sufficient to alleviate permanent damage arising from spinal cord injury (SCI). Using a rat model of injury, the authors show that single-dose treatments of both erythropoietin (EPO) and methylprednisolone sodium succinate (MPSS), two potential therapeutic compounds, can significantly reduce the concentration of proinflammatory cytokines locally and distally in the days following injury. However, only EPO treatment produced additional benefits such as a reduction of posttraumatic gliosis, attenuated scar formation, and improved recovery of hind limb function. But when MPSS and EPO were administered together, the two agents did not act synergistically. Rather, MPSS antagonized the beneficial effects of EPO, and gliosis and motor recovery returned to basal levels, even though the EPO receptor remained up-regulated. Until the mechanisms for this antagonism become understood, Gorio *et al.* suggest that glucocorticoids such as MPSS should not be coadministered with EPO in future clinical trials evaluating the effectiveness of this hormone for treating SCI. — N.Z.



Localization of EPO-expressing neurons in injured rat spinal cord at 4 weeks, with recombinant human EPO treatment.

"Methylprednisolone neutralizes the beneficial effects of erythropoietin in experimental spinal cord injury" by Alfredo Gorio, Laura Madaschi, Barbara Di Stefano, Stephana Carelli, Anna Maria Di Giulio, Silvia De Biasi, Thomas Coleman, Anthony Cerami, and Michael Brines (see pages 16379–16384)

PSYCHOLOGY

Rapid perception of face and body expression agreement

Hanneke Meeren *et al.* report that observers judging a facial expression are strongly influenced by emotional body language. The authors created composite photographs of fearful and angry faces and bodies in two congruent and two incongruent combinations. Electrical brain activity was recorded from the scalp of 12 subjects as they attended to the face in the photographs and judged its emotional expression. Photographs were shown for 200 ms, which required the observers to judge the faces on the basis of a "first impression" and to rely on global processing rather than on extensive analysis of separate facial features. When face and body conveyed conflicting emotional information, the observers' judgment of facial expression was hampered and became biased toward the emotion expressed in the body. An enhancement of the occipital P1-component, which reflects processing of the low-level features of a stimulus, was observed as early as 115 ms after presentation. These findings suggest that a neural mechanism exists for rapid, automatic perceptual integration of visual information outside the focus of attention, allowing processing of the relation between facial and bodily expressions before full establishment of the structural encoding of the stimulus and conscious awareness of the emotional expression. — R.N.

Examples of congruent vs. incongruent face–body stimulus images.

"Rapid perceptual integration of facial expression and emotional body language" by Hanneke K. M. Meeren, Corné C. R. J. van Heijnsbergen, and Beatrice L. M. F. de Gelder (see pages 16518–16523)