TOUCHING BASE

QUESTIONS? THOUGHTS? IDEAS?
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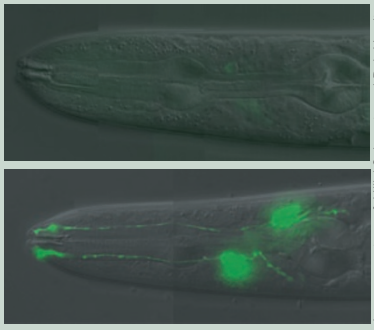
Mutant of the Month



Images courtesy of Hillel Schwartz and Bob Horvitz

This month we feature the *C. elegans ced-3* mutant to highlight its role in proving that apoptotic cell death is under genetic control. This mutant was identified by Hilary Ellis and H. Robert Horvitz in 1986 in a screen for EMS-induced mutations that disrupt the normally invariant death of specific cells during *C. elegans* development. The images above show the cephalic companion neurons visualized using a *pkd-2::gfp* reporter; these cells normally die in wild-type hermaphrodites (top) but survive in *ced-3* loss-of-function mutants (bottom). Subsequent investigation revealed that *ced-3* encodes a caspase that cleaves various cellular substrates and forms the core of the apoptotic cell death machinery. This line of investigation, along with the Sydney Brenner's development of *C. elegans* as a model for genetic studies of cell fate and John Sulston's mapping of the cell lineages of *C. elegans*, was rewarded with the 2002 Nobel Prize in Physiology or Medicine. ***EN***

The Sol Spiegelman Papers

The National Library of Medicine recently added a selection of the papers of Sol Spiegelman to 'Profiles in Science', its growing online archive devoted to prominent figures in the history of twentieth-century biology and medicine. Winner of the 1974 Albert Lasker Award for Basic Medical Research, Spiegelman's career spanned the formative years of molecular biology, to which he and his collaborators made seminal contributions. His work in nucleic acid enzymology at the University of Illinois included the identification of the first RNA replicase (in the Qβ phage), the technique of RNA-DNA hybridization and the demonstration of template specificity in viral polymerases, among other accomplishments. Later, as director of Columbia University's Institute of Cancer Research, Spiegelman and colleagues developed methods to detect viruses in human tumors, most notably the 'simultaneous detection test', which assessed viral DNA, RNA and reverse transcriptase in a single step and greatly facilitated advances in the field of human tumor virology. In addition to key manuscripts and summaries, his online papers include correspondence with many other scientists. Included is a telegram to Arthur Kornberg upon his winning the Nobel Prize in 1959: "Please accept my warmest congratulations. I am tempted also to congratulate the Nobel committee for its unaccustomed promptness in recognizing the obvious. You will have to admit that it was not all hard work, that some ingenuity was involved. If you can't, let me admit it for you. In any case wear it in good health." And Kornberg's graceful reply: "Yours is one of the messages that affected me most and contributed to the intoxication of the day. What a day! This game of Swedish roulette neglects so many more than it selects; I wish it weren't so." The Spiegelman papers can be found at http://profiles.nlm.nih.gov/PX/. *AP*

Written by Myles Axton, Emily Niemitz & Alan Packer

"I want to show that there's nothing especially magical about my genome. It doesn't hold secret knowledge that will allow others to harm me as they might by sticking pins into a voodoo doll."

—Esther Dyson, explaining her reasons for participating in George Church's Personal Genome Project (in an article she wrote for the *Wall Street Journal*)

All bases covered

The cover of this issue is the genetic code visualized as a six-set Edwards-Venn diagram with $2^6 = 64$ areas—one for each codon—designed by Anthony W. F. Edwards (University of Cambridge), who explains the diagram as follows: "In each area, the first base is U, C, A or G according to which quarter it falls in (**Fig. 1**); the second base is mapped similarly by **Figure 2** and the third by **Figure 3**. The full diagram is therefore an overlay of **Figures 1**, **2** and **3**, with each area now corresponding to a codon. Codons in contiguous areas always differ by just one base. Coloring the areas according to their corresponding amino acids leads to the final diagram. We have selected colors that help to classify the amino acids as basic, acidic, polar and nonpolar. Gray is used for the three stop codons." The origins of the Venn diagram and Edwards's multidimensional extension of it can be found in his book, *Cogwheels of the Mind: The Story of Venn Diagrams* (Johns Hopkins University Press, Baltimore, 2004). This design was first published in *Nature Precedings* (doi:10.1038/npre.2007.682.1). *MA*

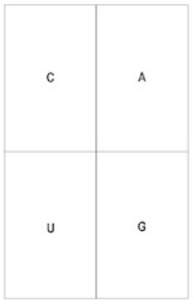


Figure 1 First Base

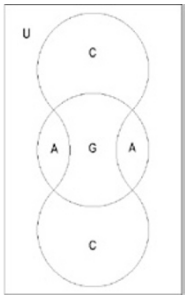
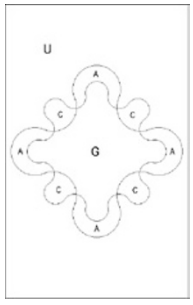


Figure 2 Second Base



A.W.F. Edwards

Figure 3 Third Base