TOUCHING BASE

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Mutant of the Month

To toast the end of summer and the beginning of the academic year, we hark back to the 1996 description of zebrafish hematopoietic mutants by David Ransom and colleagues (*Development* 123, 311–319; 1996). Most of the mutants representing 17 complementation groups were named for red and white wines. September's MoM, freixenet (*frx*), is a recessive embryonic lethal mutant whose red blood cells are lysed when exposed to as little as 2 h of ambient light. When exposed to ultraviolet light, the red blood cells are also autofluorescent. This is a common feature of erythropoietic porphyria syndromes, suggesting that *frx* may be a useful disease model. In such syndromes, the level of free erythrocyte protoporphyrin is increased to toxic levels, leading to photosensitivity of the skin, as well as blisters, itching and swelling. The mutated gene underlying the *frx* phenotype is unknown. In the outside world, Freixenet is the world's largest producer of sparkling wines made by blending as many as 40 still wines with sugar, brandy and yeast. The secondary fermentation that follows generates the carbon dioxide that lends the necessary effervescence to the finished product. The wine was first made in the Alt Penedès region of France. The fish are from Tübingen. ***AP***

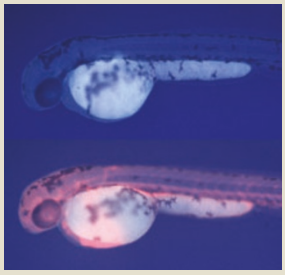

Photo courtesy of David Ransom

$1,000 genome

The National Human Genome Research Institute (NHGRI) announced on 8 August 2005 the recipients of Revolutionary Genome Sequencing Technologies grants, totaling more than $32 million, with the aim of reducing the cost of DNA sequencing of a mammalian genome to less than $1,000. The research sponsored by these grants is focused on developing new sequencing technologies to reduce the cost and time needed for whole-genome sequencing and on expanding the use of these methods throughout biomedical research and health care. The ultimate goal is to enable the sequencing of individual genomes as part of routine medical care. Recipients of the latest '$1,000 genome' grants include several groups proposing to explore the use of nanopores, tiny holes that allow the passage of one strand of DNA at a time, for identifying single nucleotides on the basis of shape and electrical properties. Other grants will attempt detection of single nucleotides in real-time as they are incorporated into DNA and others will explore the use of droplet-based microfluidic electrowetting technology for sequencing by synthesis reaction chemistry. *OB*

Touching Base written by Myles Axton, Orli Bahcall and Alan Packer.

"The $1,000 genome has been my passion and obsession ever since I was a graduate student." —George Church

Two new sequencing methods

In comparison to the goals of the NHGRI grants, the original human genome sequencing cost ~$800 million, and repeating this today is predicted to cost ~$20 million. Two recent studies present new sequencing methods to scale down the predicted cost for sequencing a human genome to ~$1–2 million. George Church and colleagues at Harvard University report that their method, applied to resequencing an evolved strain of *Escherichia coli*, had an error rate of less than 1 per 1 million bases (*Science*, published online 4 August 2005; doi:10.1126/science.1117389). Another method developed by 454 Life Sciences was used to sequence the genome of *Mycoplasma genitalium*, with 96% coverage at 99.96% accuracy in a single run (*Nature*, advance online publication 31 July 2005; doi:10.1038/nature03959). *OB*

$0.25 life extension

The incidence of chronic kidney disease is rising globally, largely because of type 2 diabetes mellitus and hypertension. Kidney disease is becoming more common worldwide in indigenous populations exposed to a constellation of new environmental factors and disproportionately affects minorities in rich countries. According to the US Renal Data system (http://www.usrds.org/), African Americans have an incidence of end-state renal disease of 988 per 1 million, compared with 254 per 1 million European Americans. Although it will take a lot of time and money to the understand the genetic, social and environmental causes of these diseases, some startlingly effective local solutions are emerging from developing countries. This was apparent at the World Congress of Nephrology in June 2005 organized by the International Society of Nephrology (http://www.isn-online.org/), together with its Asian Pacific and Singapore counterparts. Muthu Krishna Mani reported the results of an eight-year program aimed at preventing chronic renal failure in an entire population of 25,000 people in Chennai, India (*Kidney Int.* **67** Suppl., S75–S78; 2005). Subjects were administered a questionnaire, blood pressure measurement and simple urine tests for glucose and protein. People with hypertension or diabetes were tested further and treated with inexpensive drugs. The project cost ~25 cents per capita and was judged to have achieved good control of diabetes and excellent control of blood pressure. *MA*

cartoon by Sean Taverna

"Have you considered changing model organisms?"