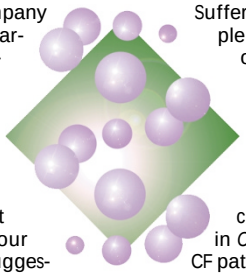
TOUCHING**base**

Jurassic ark

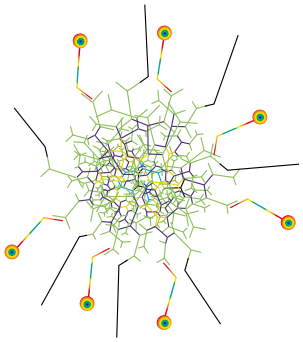


Robert Lanza and colleagues, of the biotechnology company Advanced Cell Technology (ACT; Massachusetts), have carried out what they claim to be the first successful experiment in interspecies nuclear transfer (*Cloning* **2**, 79–90; 2000). They report the apparently normal embryonic development of several fetuses obtained by somatic transfer of nuclei from an endangered bovine species (*Bos gaurus*) into enucleated eggs of common dairy cows (*Bos taurus*), followed by implantation into surrogate *B. taurus* mothers. The announcement was echoed in news magazines and illustrated with colour pictures of giant pandas and Sumatran tigers, with the suggestion that they might be saved from extinction by the new technology. The Spanish government has already set up an agreement with ACT to attempt to bring back to life the last bucardo mountain goat, a female who was recently crushed to death by a falling tree, and immediately frozen. Cloning this animal is unlikely to resurrect the species, as a male would be required at some point in the proceedings. Crossing the female clone with a regular goat is unlikely to produce fertile offspring, interspecies transfer of Y chromosomes is not around the corner and, in any case, neither of these approaches would produce 100% bucardos. That clonal expansion restricts diversity is also a major limitation of the technique in the revival of species. Therefore, the sensational announcement should not distract authorities from sustained efforts in wildlife conservation. It is disturbing that the experiment is published before the birth of a live animal. The young science of mammalian cloning is still problematic and its potential benefits have yet to be realized. Aggressive advertising seems a poor substitute for scientific demonstration.

Sinusitis and cystic fibrosis

Sufferers of chronic sinusitis may share a genetic link with people with cystic fibrosis (CF). A study in the 11 October issue of the *Journal of the American Medical Association* (vol. **284**, 1814–1819; 2000) indicates that some people with chronic sinusitis have a single copy of the CF gene (*CFTR*). Chronic sinusitis is a hallmark of CF, which prompted researchers to investigate a possible link. A team led by Garry Cutting at the Johns Hopkins University carried out a study of people with chronic sinusitis and looked for the presence of mutations in *CFTR*. There are nearly 800 different varieties of *CFTR* in CF patients, but it's a small handful—16—that make up 85% of the CF cases worldwide. The authors looked for the presence of these 16 variants in the DNA of 147 sinusitis sufferers and 123 people without sinusitis. (People with CF were excluded from the study.) They found that 7% of sufferers carry a single mutant *CFTR* allele and that they are five times more likely to do so than controls. The researchers emphasize that having a single mutation does not cause CF—two are needed for the disease. So what's gone wrong in CF and sinusitis patients? CFTR normally helps control the flow of salt and water across the membranes in the lungs. Mutant CFTR affects the mucous membranes; a thick mucous accumulates which provides a breeding ground for bacteria. Whereas CF affects the lungs, sinusitis involves the mucous membranes of the sinus cavities near the nose, eyes and forehead and, like CF, is frequently associated with bacterial infection. But don't expect a cure for sinusitis any time soon. The 'CF' gene was the first good candidate for gene therapy, but little advance has been made since its discovery 11 years ago. The study, however, may open new avenues of research and lead to new diagnostic and treatment strategies. Come that day, we'll all breathe more easily.

Doing it with dendrimers



One of the latest tweaks to microarray design is the development of a dendrimer-based method, described by Robin Stears and colleagues in a recent issue of *Physiological Genomics* (vol. **3**, 93–99; 2000). The solid phase of the microarray is according to custom, whatever that custom may be. (Stears *et al.* spotted cDNA probes onto glass.) Instead of synthesizing target cDNA and incorporating into the synthesis Cy-labelled dNTPs, a tailored primer is used, whereby a defined oligonucleotide (called a capture sequence) of about 31 bases is attached to an oligo dT. Reverse transcription proceeds. One defined oligonucleotide is used for one pool of RNAs, and another, for the comparison set. As with standard Cy3 and Cy5 populations, these are mixed and incubated with the array to permit hybridization. After washing away the unbound target, the dendrimers descend. These are sphere-ish macromolecular structures built up of oligonucleotides in a structure that is not unlike a rigid 3D chain-linked fence (see inset). At the perimeter of the dendrimer synthesized by Stears *et al.* extend 324 oligonucleotides of defined sequence, to which fluors and tethers may be attached. Lots of them (see http://www.genisphere.com). Dendrimers are synthesized as generic units, after which probes are attached: each dendrimer receives about 10 identical probes that are complementary to one or the other of the capture sequences, and about 250 fluors. Which is not unlike a Christmas tree, according to one researcher who rates the design of the system. The 1:1 ratio of the two 'reporters' seems likely to permit a more accurate comparison between the sample and reference pools than is the case when using targets generated by dye incorporation during reverse transcription. Second, the method requires smaller amounts of mRNA than the routine method—about 0.5–10 μg (compared with 50–150 μg). This should address technical and some ethical concerns of those working with mouse tissues (mice are small; tissue is limited). Geoffrey Childs (of the Albert Einstein College of Medicine) finds a modified method handy when dealing with large sets of tumours and disinclined to synthesize target by linear amplification. Given a lower signal-to-noise ratio when using the dendrimer method, Childs prefers to use the method when querying samples of limited quantity**.** Stears and colleagues are currently optimizing the procedure, focusing, among other things, on whether their hypothesis that one dendrimer binds per bound target is correct.

Designer brotherly love

For the first time, preimplantation genetic diagnosis (PGD) has been used to select for a baby with the traits required to provide a cell transplant for an ill sibling. Bandied about the general press were proclamations that, with the conception of Adam Nash, the line before the Brave New World had been crossed. Adam's older sister, Molly, suffers from Fanconi anaemia, a congenital syndrome involving leukaemia and early lethality in the absence of an allogeneic graft of haematopoietic stem cells. Her parents decided to conceive Adam by *in vitro* fertilization (IVF). They used PGD to ensure that he did not inherit the Fanconi mutation and set a precedent in ensuring that his histocompability (HLA) group matches that of Molly's, thus ensuring a suitable donor. The transplant involved no pain or risk for Adam, because it used only the blood from his umbilical cord. Adam is certainly not the first 'designer baby', as selection has been routinely applied for decades. Critics suggest that "this time is the first time that selection was not strictly based on the best interest of the baby itself". But IVF egg and sperm donors are chosen according to parental preferences that are not obviously relevant to the 'best interests' of the resulting child. John Wagner, a pioneer in umbilical cord blood transplantation (Fairview Univ., Minnesota) who performed the operation on Molly, preferred that the procedure be made public so that "we don't let people die today because of a fear that's theoretical". However, the case paves the way for less straightforward cases. For example, children with sporadic leukaemias are in as much need as Molly was, and cord blood banks cannot meet the demands of most affected children. Now that Molly has received Adam's cells, who will deny parents the right to select additional offspring so as to ensure a suitable donor for a dying child?

© 2000 Nature America Inc. • http://genetics.nature.com