Future Brief
A Publication of New Global Initiatives, Inc.

www.futurebrief.com

The Genetic Revolution Is Already Here!

Jeffrey R. Harrow
Principal Technologist, The Harrow Group

Let's face it: "genetic engineering" (our modifying a living organism's gene structure for specific goals) is showing up in the news on a regular basis -- Google serves up more than one million hits when asked. But although there is a lot of early progress going on in labs, the average person has yet to directly benefit from genetically engineered drugs or other products, much less from one of the potentially logical outcomes of such research -- genetically engineered "design-your-own" kids.

But the genetic cat is now out of the bag, quite literally, and the results of genetic engineering are already beginning to show up in some very surprising ways!

Food

The European Union has just approved the broad importation of Monsanto's "NK603" corn throughout the EU. This corn is designed to thwart a nasty parasite that attacks traditional corn, and it could bring a greater yield per acre.

According to the EU, this Genetically Modified (GM) corn has been proven safe, and they have established stringent consumer packaging rules so that people can make informed decisions as to whether or not to consume GM foodstuffs.

"To GM, or not to GM," is an interesting choice that we're going to have to increasingly make. As genetic engineering continues to improve; the time may well come when we find that GM food is safer, more abundant, perhaps better tasting, and conceivably less costly (due to better yields, the need for less pesticides, etc.), even though the GM seed manufactures will surely charge more than for traditional seed.

BUT - this isn't all a bed of (natural or GM) roses. Some GM crops are explicitly designed not to naturally propagate, requiring that farmers purchase new GM seed each season. What would happen if a major GM seed supplier suddenly found a serious problem in its production capacity (think flu vaccine), or with the widely-used product itself? Or if a major supplier went bankrupt? Or, perhaps more chilling, what if it took several years or longer for long-term health issues

related to consuming GM crops to come to light? Would we even have sufficient stocks left of "natural" seed to feed a hungry world?

I'm certainly not saying that genetically modified food is necessarily "bad"; the upside potentials for the growing number of hungry humans could be very valuable. But I do wonder about possible long-term issues (after all, we're really still babes-in-the-woods when it comes to genetic engineering), and about the potential danger of moving towards patented foodstuffs that can't reproduce in the "normal" way.

It could be a global calamity if we later find out that there was a ticking time bomb unintentionally genetically engineered into our food supply. Or, consider if the political power block of what would probably be a relatively small number of GM companies were to choose to exert undue influence on nations. (Having control over a significant portion of a nation's critical resources would be a powerful position indeed. Think gas prices...)

Tabby - Modified!

But genetic engineering is NOT limited to plants, and the average person may well see the beginnings of the results of genetically engineered animals very close to home -- within two years!

Allerca is close to commercializing domestic CATS that are genetically engineered so that they don't release the dander to which many people are allergic!!

Using "gene silencing" techniques, Allerca suppresses the cat's production of the natural (human allergy-causing) protein that expresses in cat skin and saliva! (Since the protein is so small, once released from the cat it tends to remain airborne for months.)

Hypoallergenic cats!! For $3,500 each. (And each will be spayed or neutered so that you can't breed your own hypoallergenic cats)

By the way, this isn't the first genetically engineered pet. A glowing zebra fish (thanks to the addition of a fluorescent sea anemone gene) became available in pet stores earlier this year.

Future Brief
A Publication of New Global Initiatives, Inc.

www.futurebrief.com

Tabby - Xeroxed!

Of course purpose-built genetically modified cats are only the very beginning. For example, "Genetic Savings & Clone" (I love the name!) is already in the business of cloning your favorite aging cat!!

The personality isn't cloned, of course; only the body. But it should be a faithful copy of "your pet." However you'll REALLY have to like your cat, as the clone will currently cost you $50,000.

I certainly expect that prices will decline over time, especially if/when competitors spring up. But even now this type of cloning might be a viable expense for successful show cats. And later, if/when such commercial capabilities migrate to other species, imagine the incentive to clone triple-crown winners like Secretariat and Seattle Slew! Or a prize bull. Or...

Oh -- if you're a dog lover? Just wait until 2005 when cloning your pooch should be possible as well.

BioEthics

I suspect that not too many people will get upset about the commercial cloning of pets. But as is so often the case, I also expect that this technology will move forward to the point that, eventually, humans can be cloned as well. And that will (and should!) raise all sorts of ethical and societal questions.

(By the way, for good and for bad, and regardless of our beliefs and preferences, I DO expect that once human cloning becomes technically feasible, it WILL happen somewhere, even if not in those countries that ban or very closely control the process. Ethics are very different in different societies.)

The issues and questions surrounding such capabilities are numerous, and tremendously significant. Consider just a few examples:

- If you were to generate an "aware" clone of yourself while you were still alive, and if (as expected) it had identical fingerprints and DNA, then a "bad clone" (one whose personality evolved towards the dark side) might not be distinct from you for forensic purposes.

- Come to think of it, if you DID generate a living and aware clone, would he/she/it be a legally independent being with all the rights and protections that a society confers on its citizens?
- What would happen if someone killed that clone -- would this be murder?
- If you died while you had an 'aware clone,' would it simply pick up your life, inherit all your assets, and perhaps even your family? After all, DNA testing would "prove" that it is "you!"
- Would it be acceptable to grow and maintain a non-aware clone (perhaps by suppressing the genes that develop the higher brain functions) so that a critical organ transplant could be performed if needed?
- And then there's that (seemingly) sci fi specter of cloned Schwarzeneggeresque armies (think Star Wars' Attack of the Clones, or Lord of the Rings)...

Of course the list of questions and issues goes on. But now that commercial pet genetic engineering and cloning are real, we need to extrapolate and explore and address these issues with the expectation (or at least the hypothesis) that somehow, somewhere, human variants too are going to become real -- whether we individually, or even nationally, think this is right or wrong.

In fact, given the double-exponential growth of biotechnology as it melds into the converging synergy of NBIC (the coming together of Nanotechnology, Biology and medicine, Information sciences, and Cognitive sciences), we may have to answer these questions far sooner than we might have imagined.

Careful!

I have no doubt that these scientific achievements will move forward -- knowledge is a VERY hard thing to suppress and, as we've learned historically, suppression attempts are rarely if ever successful. So perhaps we should engage in these ethical and societal discussions in advance, so that we can move carefully -- very carefully -- and safely, as the technologies do move forward.

And as we do so, we should be sure to pay attention to very broad areas that reach far beyond the mere "technical" issues that genetic engineering and cloning will raise. After all, the results of these sciences have the ability, quite literally, to alter "us" and the very world in which we live, work, and play.

Future Brief
A Publication of New Global Initiatives, Inc.

www.futurebrief.com

To put it mildly:

Don't Blink!

This essay is original and was specifically prepared for publication at Future Brief. A brief biography of Jeff Harrow can be found at our main Commentary page. Other essays written by Jeff Harrow can be found at his web site. Jeff receives e-mail at jeff@theharrowgroup.com. Other websites are welcome to link to this essay, with proper credit given to Future Brief and Mr. Harrow. This page will remain posted on the Internet indefinitely at this web address to provide a stable page for those linking to it.

To hear about future **Commentary** essays, take a few seconds to read about Daily Brief, one of the "briefest" Internet updates offered anywhere.