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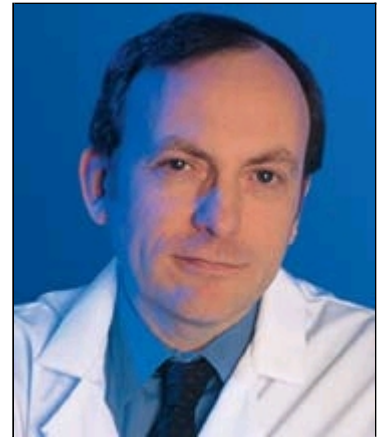
## REPORT

The Media Befriend  
De-Aged Clones

by Gregory M. Fahy, Ph.D.

Not long ago, the concept of human cloning was so controversial that the US government was scrambling to ban it, and much suspicion surrounded any thought of using cloning in any way for medical purposes. How times change. With the announcement by Advanced Cell Technology (ACT) about its new therapeutic cloning breakthrough in the April 28th 2000 issue of *Science*, the media have been happy to cover the new window on the anti-aging medical uses of cloning that has been opened, and hand-wringing over ethical issues has made practically no impact on the coverage at all.

The media story begins with the interview conducted by the Life Extension Foundation (LEF) with the President and CEO of ACT, Dr. Michael West. The moment the *Science* news embargo was lifted, the day before the April 28th issue came out, LEF had the whole story available for its members and other readers in the form of its truly in-depth interview on its web site, once again providing incomparably more thorough coverage than other sources, and including in addition not only exclusive photographic illustrations of Dr. West and ACT facilities, but also literature references to all of the key statements made in the interview! (The interview appeared in the June issue of *Life Extension* magazine.) At the same time, LEF distributed a press release to all the major news media to call their attention to the report in *Science*. Here are some of the media responses.



The Reuters news service issued a story called "Cloning produces unnaturally young cattle." The report somewhat inaccurately claimed that "researchers said it might be possible to use cloning to create organs that are nearly immortal for use in transplants." It accurately quoted lead author Robert Lanza, who said "Not only were we able to clone calves, but these animals appear to have cells younger than their chronological age. . . and should live longer, healthier lives." Unfortunately, as the story concluded, it will take a long time to test the latter expectation since "cows allowed to lead natural lives live to be 24 and older."

The story quoted arch deathist, Leonard Hayflick, who made the dangerous (for a deathist) and awesome admission that "the oocyte (egg cell) apparently is the rejuvenating environment that makes babies young." The story also quoted Dr. West as saying "The egg cell acts like a little time machine and can take it back, as far as we can tell, to the beginning of life. It's kind of abracadabra and through processes we don't understand, they get reverted. It's totally cool. It's the first day in a new era in treating age-related disease."

The Reuters report did notice that "of course, this would involve technically cloning the patient, and there would be opposition to allowing it," but then casually accepted as sufficient the vague explanation from Dr. Lanza that "once people understand the science here, the more they hear about it, the more likely they are going to say this is a good thing."

CBS Healthwatch issued a story on April 27th by Dulce Zamora entitled "Cloning procedure may help fight human diseases." The article suggested "the findings could potentially lead to breakthrough treatments of human conditions such as heart disease, diabetes, muscular dystrophy, liver disease and skin disorders." Telomere expert Jerry Shay was quoted as describing the ACT process in rather oversimplified fashion as follows: "We could take an old person's cell, and rejuvenate it through a cow cell. That cow cell is going to rejuvenate that human old cell and make it young again. We can then take those cells and give them back to the same person who donated that cell in the first place." Dr. Robert Lanza, Vice President of Medical and Scientific Development at Advanced Cell Technology, was quoted as saying "An old cell can be made young again. [The widespread belief is that] aging is irreversible. What this study shows, for the first time ever, is that that's not true."

CNN posted a story at 2:50 p.m. on April 27th called "Scientists rewind aging clock in cells of cloned cows, study says." The report quoted Douglas Wallace, director of the Center for Molecular Medicine at Emory University, as saying "So what's exciting is, if we can reset the telomere program, then the cells could grow longer and we could get enough cells to do the kind of therapeutics that I think people would like to see," glossing over the fact that this capability has been shown independently of the cloning

experiment by the restoration of telomerase in normal cells.

The CNN coverage quoted Wallace as saying “We can make no predictions on the life span of these calves, and obviously what needs to be done is to have a lot of these calves and see if their mean life span is longer or shorter.” Lanza, however, feels that the clones’ cells “should be able to repair damage due to disease and aging” and that therefore the clones should live longer.

MSNBC News carried a story very similar to the Reuters report (even word for word identical in many places). The story mentioned cloning applications “to increase the breeding years of farm animals.” It also quoted Dr. West as saying “It remains to be determined whether this would extend the life of the animal.”

As far as ethical issues are concerned, the report again downplayed them and ironically used Leonard Hayflick to brush such concerns aside. To quote: “any human work could be mired in an ethical debate, as it would technically involve cloning the patient. But there’s no denying the scientific value of the work, said Leonard Hayflick,” who was described by the story as “the discoverer of the aging process in human cells.” Hayflick, who was identified as not being involved in the ACT breakthrough, was quoted as saying “this study represents a milestone in our efforts to understand how mammalian longevity is determined.”

The story also noted “Dolly had old telomeres. But the six heifers, cloned from cells taken from a 45-day-old fetus, have exceptionally young telomeres. What is even more surprising is that the cells the ACT team cloned were not fresh and new. They had been grown and allowed to divide over and over again in the laboratory until they were senescent.” The ACT team was said to have used “a slightly different cloning process than that used to make Dolly” that involved “fibroblast or connective tissue cells for the cows” versus the “mammary cells for Dolly.”

Lanza was quoted as saying “If you had a damaged heart, we could take a few cells from you and grow up new heart cells and these would be your own cells so you wouldn’t reject them.”

The Miami Herald issued an unusually astute story on April 28th, entitled “Scientists reverse aging process in laboratory cloning experiment” (isn’t this just the kind of headline we used to hope would appear in the year 2000?!). The leading paragraph captured the story with uncanny accuracy and succinctness: “Researchers say they have found a way to reverse the aging process in the cells used to create cloned calves, potentially overcoming one of the biggest obstacles to cloning human organs, from replacement hearts to new brain cells for victims of Alzheimer’s disease.” The article noted that the problem of premature cellular aging seen with Dolly raised “fears that clones could be doomed to premature decline and death,” and contrasted this with the ACT clones, whose “cells in fact appear to be 50% younger than other calves born at the same time,” concluding that the breakthrough “vastly reassures scientists who had worried that clones might be born with prematurely aged cells.”

Lanza was quoted as saying “you might be able to produce young, healthy cells by the billions or trillions—enough to make a patch for a damaged heart, or even a whole heart itself.” West was quoted as saying “you can run the biology in reverse. . . . to transform old, worn-out cells into pristine embryonic cells with a normal—or perhaps even extended—lifetime ahead of them.” The article also quoted Dr. Ronald DePinho, a researcher at Harvard and the Dana-Farber Cancer Institute, who said “we now have this really elegant story that tells us we can take cells from mature individuals and reset their telomere clock.”

The journal *Science* itself sometimes makes special note of its own reports, and sometimes does not. For example, *Science* did not promote the Prolla/Weindruch report on the genetics of aging that we covered extensively in *Life Extension* magazine and on the LEF web site. But it did promote the ACT results. The April 28th issue of *Science* contained a “News of the Week” feature article called “Cell Biology: In Contrast to Dolly, Cloning Resets Telomere Clock in Cells” (*Science* 288: 586-587, 2000; by Gretchen Vogel). On the ethics issue, the report says “such research cannot be done in many countries because the procedure requires creating and then destroying a human embryo, and many also worry that therapeutic cloning would open the door to human reproductive cloning. Earlier this month, however, the influential Nuffield Council on Bioethics in Britain said that the potential benefits of therapeutic cloning outweigh the ethical concerns, and a British government panel is expected to rule in favor of the research.”

The coverage also brought out some little-known facts about defects in cloned animals, saying of the ACT clones, “at birth, the animals showed the now-expected characteristics of cloned animals—they were larger than normal newborns and had high blood pressure and difficulty breathing. But by two months of age, the animals seemed healthy and normal.”

Because the clones’ cells were capable of dividing in culture 93 times, as opposed to 61 times for control calf cells of the same age, Lanza speculated that there is “a real possibility” that the clones might live up to 50% longer too, or “up to 180-200 years in the case of humans.”

Nobody can explain why the ACT clones have escaped the Dolly phenomenon, but Jerry Shay (of the University of Texas Southwestern Medical Center in Dallas) hypothesizes that “starting with relatively short telomeres in the senescent cells might prompt the early embryo to overcompensate and grow unusually long telomeres.”

In any case, the story reports, a group in Connecticut has found, in unpublished results, that calves cloned from adult cows in their hands also escaped the Dolly effect, and another group in New York City found similar results in additional unpublished studies on cloned mice.

The final paragraph of the coverage points toward what may be the final frontier in cloning research, and perhaps even in anti-aging research as well. "The researchers hope the findings will provide insights into the source of the egg cell's rejuvenating power. 'Ultimately, we want to understand how that reprogramming goes on in the oocyte so we could do it in vitro' and skip the embryo stage, [George] Martin says. Several groups are working toward that goal, hoping to produce replacement tissues without the ethical baggage."

Look forward to a renaissance in cloning and aging research in the near future.

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