Politics overwhelm ecology in Australia

Supreme test for the census

EMBRYOLOGY

Use of Stem Cells Still Legally Murky, But Hearing Offers Hope

Biologists who were called to Capitol Hill last week to testify about the ethics of their research on human stem cells were expecting "a thunderstorm," as one of the witnesses said. Their controversial work, which extracts cells from human embryos and aborted fetuses and coaxes them to grow in cell lines capable of developing into any tissue type, made headlines in November (*Science*, 6 November, p. 1014). But the atmosphere in the 2 December congressional hearing was calm. Members of the panel—the Senate appropriations subcommittee for health and human services, chaired by Arlen Specter (R–PA)—seemed more interested in biology than bombast.

If researchers were hoping that the hearing would clarify whether they can use these versatile cell lines in federally funded research, however, they were disappointed. For the third year in a row, Congress has passed an appropriation bill that forbids funding research in which an embryo is "destroyed, discarded, or knowingly subjected to the risk of injury or death." The key question is whether this ban applies to research using the new stem cells because they were derived from embryos. National Institutes of Health (NIH) director Harold Varmus testified that the Administration is still studying the legal issues. And although Specter and the ranking Democrat, Tom Harkin of Iowa, said that they want to encourage this research, Specter said Congress is likely to move slowly in reviewing whether the law needs to be changed.

In an interview after the hearing, Specter said that new stem cell research "has tremendous practical applications," adding that it is "obviously on the cutting edge, and that's why Tom [Harkin] and I decided we ought to move ahead" with a public inquiry before the 106th Congress begins in January. But he said, "There's going to be a lot of controversy," and "I don't think there can be a rush to judgment." Specter noted that Harkin had already concluded that NIH would not violate current federal law if it funded experiments using the new stem cell lines because—as researchers testified at the hearing—the cells cannot develop into embryos without radical experimentation (which no one is attempting). But Specter said, "I would not want to make that legal judgment based on this state of the record and my knowledge. I think that, for that conclusion to carry public support, you have to do it in a little more systematic, thoughtful, recordmaking way." Varmus, at least, came away encouraged. When he met with his advisory council the next day, he described the hearing as "an upbeat conversation."

In suspense. Harold Varmus (left), James Thomson (center), and John Gearhart (right) await a decision on funding of stem cell research.

The impetus for reexamining the law comes from announcements by two academic biologists. James Thomson of the University of Wisconsin, Madison, and John Gearhart of The Johns Hopkins University in Baltimore revealed in November that they have established long-lived cultures of human stem cells. They hope that these cells can be used to create transplant tissue for people who cannot find suitable donors. Gearhart piqued everyone's interest at the Senate hearing by displaying photos of human neurons derived from his cells. He and others predicted that within 10 to 20 years it will be possible to grow healthy neurons to replace damaged brain cells in people with Parkinson's disease.

"I've been hearing from many scientists" who want to work with the new cell lines, Varmus says. But so far, NIH hasn't allowed any NIH-funded researchers to do so, because the methods of deriving these cells may cross into forbidden territory. (Gearhart and Thomson both relied on private money to develop the cell lines.) Cells obtained by Gearhart's method are less controversial because they come from aborted fetuses, and federal guidelines since the 1970s permit some research on fetal tissue if the abortion clinic and the research lab are separate. But Thomson's cells are in a different category. They were extracted from embryos donated to research by couples who had undergone in vitro fertilization procedures. The experiments Thomson performed to establish the cell lines, all witnesses agreed, could not be supported with federal money under current law. But Harkin and others suggested that Thomson's stem cells—because they are not embryos—could be used by NIH-funded scientists.

The only strong dissent from Harkin's interpretation came from Richard Doerflinger, a spokesperson for the Committee for Pro-Life Activities of the National Conference of Catholic Bishops. He noted that it would be a crime to do Thomson's experiments under the unusually restrictive laws of Pennsylvania—Specter's state. As for Thomson's cell lines, Doerflinger said that "ethical principles reflected in current law … argue against funding the research." Doerflinger acknowledged, however, that there was no apparent barrier to federal researchers using Gearhart's stem cells—although Doerflinger made it clear that he disapproved.

Several expert groups—in addition to members of Congress—are now deliberating on issues surrounding both types of cell lines. At the president's request, the National Bioethics Advisory Commission (NBAC) is conducting a comprehensive ethical review, due sometime next summer. Varmus says he may not need to wait for NBAC's conclusions, however, because he received good ethical advice from his own advisory panel on embryo research in 1994. But before he can act, he needs a response from the general counsel of the Department of Health and Human Services and the Office of Manage-

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1971
Sloan survey spots farthest quasars

LEAD STORY 1972

Blueprint for a worm

1976
Grassroots challenge to Microsoft

ment and Budget at the White House on whether the current law bars federal support for work with the new cell lines. If they determine that it does not, researchers may be able to use the cells even if Congress does not change the law to make the permission explicit. "I hope we will have an answer to these questions soon," Varmus said, but "I can't say how long it will take."

–ELIOT MARSHALL

EXPERT WITNESSES

Scientific Panel Clears Breast Implants

Kicking off a momentous 2 weeks for science in the courtroom, a scientific panel on 30 November issued a long-awaited report finding no evidence that silicone breast implants cause systemic diseases in women. The report may lay to rest one of the biggest scientific-legal controversies of the decade, involving thousands of lawsuits seeking billions of dollars in damages. "It is absolutely as strong a report against the plaintiffs' position as one could imagine," says Michael Green, a law professor at the University of Iowa, Iowa City.

Legal scholars are paying close attention, because the panel is part of a sea change in courtrooms since a 1993 U.S. Supreme Court ruling called on trial judges to scrutinize the validity of scientific evidence themselves before it is presented to a jury. "Before, there probably never would have been a scientific panel in such really important litigation," says Daniel Capra, a professor at Fordham Law School in New York City. Scientists may not be the only experts affected: Earlier this week the Supreme Court heard arguments in a case in which it could offer guidance as to when other kinds of expert testimony—including that from engineers and physicians—should meet scientific standards.

The backdrop for all this is the 1993 Supreme Court decision in *Daubert* v. *Merrell Dow Pharmaceuticals*, in which the court called on federal trial judges to act as "gatekeepers" and screen out so-called junk science. The court suggested four tests, including whether an expert's views had been peer reviewed. Before then, the standard was "general acceptability" of the views. Although the decision has in some cases allowed into the record more novel kinds of testimony, such as DNA evidence, experts say *Daubert* has led overall to less scientific testimony being aired to juries.

The *Daubert* ruling also triggered wider use of Federal Rule 706, a 23-year-old law that says federal courts can assemble their own advisers. That's what Judge Sam J. Pointer Jr. of the U.S. District Court in Birmingham, Alabama, did in October 1996, when he convened an independent panel to review evidence in several thousand lawsuits claiming that breast implants caused debilitating symptoms ranging from fatigue to sore joints. Pointer asked the four-person panel* to consider whether existing research "provide[s] a reliable and reasonable scientific basis" for concluding that silicone breast implants "cause or exacerbate" lupus or other connective tissue diseases, or "atypical" immune diseases, according to the report.

Lawyers for both sides each winnowed over 2000 studies and other documents to about 40 they deemed most important for review in each expert's area. The panelists also heard scientific witnesses. Their nearly 300-page report† finds that implants are not entirely benign: It says, for example, that animal studies show silicone breast implants can cause inflammation, and that silicone droplets may wind up in tissues far from the breasts. But the "preponderance of data" does not link these effects to autoimmune disease in people, the report says. The panel's epidemiologist, who conducted several analyses of data pooled from both published and unpublished studies, found "no association" between implants and connective tissue or immune system disease.

The clean bill of health thrills implant-makers. "This is going to help bring an end to this controversy," says Doug Schoettinger, managing trial counsel for Dow Corning. Ironically, Dow Corning, which is in bankruptcy, proposed to settle its suits for $3.2 billion just a few weeks before the scientific panel released its findings. The report, however, is expected to influence Dow Corning's adversaries whether to settle or go to trial. In addition, videotaped depositions will be used in the cases overseen by Pointer.

But the report's shades of gray—including its frequent criticisms of how studies were done—has led some experts to conclude that the jury is still out. "They're saying the science is inconclusive and in many ways contradictory," says Robert Garry, an immunologist at Tulane University in New Orleans who studies women with implants. Indeed, adds Diana Zuckerman of the Institute for Women's Policy Research in Washington, D.C., the studies may not have identified problems that might develop several years after women get implants. Zuckerman says her group will reserve judgment until next year, when results are expected from a National Cancer Institute study of 17,500 women.

For now the broader legacy of the Pointer panel is unclear. "It will be interesting to see if it has an impact on future toxic tort litigation given the expense and time that it took"—$800,000 from the Federal Judicial Center and 2 years, says Margaret Berger of Brooklyn Law School. One occasion for using such a panel, says Green, might be a class-action suit in which "the evidence is emerging" and thus hasn't been weighed by scientists; he points to mounting litigation involving fen-phen, the diet drug combination implicated in heart valve disease.

Whether *Daubert* should apply to testimony from other experts, such as engineers

NUMBER OF CASES OF CONNECTIVE TISSUE DISEASES ATTRIBUTABLE TO BREAST IMPLANTS EACH YEAR

Disease	Relative risk	Cases*	Cases "due to" breast implants*
Rheumatoid arthritis	1.15	3303	4.29
Systemic lupus erythematosus	1.01	526	0.05
Scleroderma/Systemic sclerosis	1.30	164	0.38
Sjögren's syndrome	1.47	400	1.28
Dermatomyositis/Polymyositis	1.52	54	0.18

* Per 10 million women.

SOURCE: NATIONAL SCIENCE PANEL REPORT

Needles in a haystack. In a worst-case scenario, silicone breast implants would cause a handful of cases of these diseases, according to a scientific panel's analysis of pooled population studies.

* Immunologist Betty Diamond of the Albert Einstein College of Medicine in New York City, epidemiologist Barbara Hulka of the University of North Carolina, Chapel Hill, toxicologist Nancy Kerkvliet of Oregon State University in Corvallis, and rheumatologist Peter Tugwell of the University of Ottawa.

† See www.fjc.gov/BREIMLIT/mdl926.htm