

MIXING BUSINESS WITH STEM CELLS

MEDICINE

BY NEIL MUNRO

The fierce debate over federal funding for research on stem cells has focused on some profound questions, such as what are the moral tradeoffs in destroying human embryos. A less-lofty factor, however, is also shaping the debate: the pecuniary interests of the physicians and scientists performing the research.

Scientists engaged in the public debate over how best to use stem cells for the betterment of human lives are often prominent faculty members at prestigious universities and public research institutions. But often as not, they are also board members and shareholders of fledgling biotechnology companies, which stand to make hefty profits from the research the scientists are urging the government to fund. They are, in short, both disinterested scientists and very interested entrepreneurs.

This potential for conflict of interest also fuels disputes between competing groups of scientists, says Dr. Ammon Peck,

CEO of Geron Corp., which is based in Menlo Park, Calif., and is the market leader in this research. Okarma has testified repeatedly in favor of federal funding. Indeed, his company's market value is far below last July's \$700 million. The company's stock value fell 50 percent, for example, after the Bush Administration began reviewing the Clinton Administration's policy that allowed federal funding for stem-cell research.

But the media coverage has often missed the financial interests of the scientists who have been prominent in supporting government funding for research into the use of stem cells from human embryos. Anti-abortion groups and some medical ethicists support research on stem cells taken from adults, but oppose embryo stem-cell research, because the embryo is destroyed to extract the stem cells.

One of the leading scientists who has spoken out in favor of research into embryo stem cells is Douglas Melton, who

is typically identified in media reports as chairman of Harvard University's department of molecular and cellular biology. However, Melton is also a board member of Curis Inc., a Cambridge, Mass., company seeking to commercialize technologies based on stem cells drawn not from embryos, but from adult

Within the National Institutes of Health, Ronald McKay is a prominent supporter of federal funding for embryo research, and has been quoted frequently in the media as an NIH scientist. But he also helped found—and still owns shares in—NeuralSTEM Biopharmaceuticals, a company in College Park, Md. NIH transferred a patent on fetal brain cells from McKay's NIH laboratory to NeuralSTEM, which is seeking a cure for Alzheimer's and Lou Gehrig's diseases.

Since January 1, these three researchers have been quoted 216 times in the national media, including *National Journal*, in support of federal funding for research on embryo stem cells, but in only 17 citations have they been linked to their companies. Weissman's private-sector ties were reported in 16 of 48 articles; McKay's relationship to NeuralSTEM was cited once out of 124 mentions; and Melton was not linked to Curis in any of the 44 articles for which he was interviewed.

McKay and Weissman, in interviews, said they try to keep their personal financial interests out of their public statements. "I work very hard when talking publicly to express an opinion which is predominantly technically based," said McKay. "I'm quite leery of expressing political opinion ... [and] I have no involvement in the day-to-day running of the company." Weissman said that when speaking at conferences, "I always disclose.... Everybody in this area should do that."

The problem of scientists' dual interests in commercial success and in scientific truth affects more than just stem-cell research, said Edward Benz, the new president of the Dana-Farber Cancer Institute at Harvard Medical School. "It is very, very difficult to keep them separate ... in every area of medical research," said Benz, who served with Melton and Weissman on an NIH planning board that helped formulate federal policy on stem cells. The best remedy, he said, is "full disclosure.... People should disclose anytime that they have something that might bias their remarks."

Although Benz is no longer a member of the NIH board, he served while he was chair of the department of medicine at the Johns Hopkins University School of Medicine. To illustrate the close ties between



STEM CELLS: A researcher at the University of Wisconsin (Madison) looks through a microscope at culture trays containing stem cells from human embryos.

a stem-cell researcher at the University of Florida (Gainesville). "There is more politics in science," he said, "than there is in business or in politics."

Some of the private-sector advocates for federal stem-cell research on human embryos are open about how it would benefit their interests. Thomas Okarma is the

humans. Curis's market value is \$190 million.

Similarly, Irving Weissman, a scientist at Stanford University who has spoken in favor of government funding for embryo research, is also the founder of two companies, SyStemix Inc. and StemCells Inc. At StemCells, Weissman serves on the board and owns shares. The company's stock price fell from last September's \$8.00 per share to \$6.55 in July. The stock's total market value is \$135 million.

university researchers and biotechnology companies, consider this: Johns Hopkins has a licensing deal with Geron that will give the school some of the company's profits from stem-cell commercialization, because a Hopkins scientist, John Gearhart, was a co-discoverer of stem-cell potential while working with Geron. The other co-discoverer, James Thomson of the University of Wisconsin (Madison), also has a licensing deal that may gain him and his patent-holder—the Wisconsin Alumni Research Foundation—a share of Geron's profits. Thomson and Gearhart, along with McKay and two other researchers, are listed as "special contributors" to an NIH report on stem cells released on July 18. Melton, Weissman, Okarma, and Peck are also cited as contributors to the report, which did not disclose any of the contributors' financial interests.

The commingling of scientific and business concerns is also illustrated by a key stem-cell planning group at NIH. The Stem Cells and Developmental Biology Planning Group is part of NIH's National Institute of Diabetes and Digestive and Kidney Diseases, whose budget is \$1.1 billion. Of the planning group's 17 members, three are NIH officials, and the rest are university and private-sector researchers. In addition to Melton and Weissman, two of the group's other researchers are scientific consultants to Curis; one is a consultant for a New York-based company, ImClone Systems Inc. One of the Curis consultants is also working with Advanced Cell Technology Inc., based in Worcester, Mass., as it seeks to clone human embryos for experimental use.

Some of the group's members, including Benz and Dr. Leonard Zon, who works at the Children's Hospital of Boston, have no ties to the commercial sector. Zon said, however, that if his research is successful, it will likely lead to a partnership with a company—and so generate financial rewards for himself and his parent institution. Zon, who also serves on the Harvard faculty, has discovered possible methods of accelerating the reproduction of blood stem cells taken from human adults or embryos.

Indeed, most researchers get grants from NIH, and they have a potential conflict of interest in merely calling for more government funding, said former Sen. Connie Mack, R-Fla., who promotes federal funding for embryo stem-cell research. "I would think there are relatively few researchers who do not have some connection to federal funding, either directly or



RONALD MCKAY: A scientist at the National Institutes of Health, McKay also owns shares in a biotechnology company he helped found that does research on stem cells.

indirectly," said Mack, who himself sits on the board of two biotech companies based in Massachusetts, Exact Sciences Corp. and Genzyme Corp. Genzyme is working on stem cells. One test to measure possible financial influence on decision-making, Mack said, is whether a proponent held the same views before money came into the picture. "If I took a different position while I was in public life, it would be fair game to say, 'Why have you changed your position?'" said Mack, who has supported similar research since the early 1990s.

Sometimes, however, the public statements of researchers seem completely at odds with their private business interests. For example, one of the key questions about stem cells is whether research on stem cells from adults is as promising as that done on stem cells from embryos. In media interviews, some academic scientists, including Weissman and Melton, play down the potential of adult cells, arguing that such cells are not true stem cells, or that embryo research is needed to fully understand adult stem cells. Yet much of the private research being done on stem cells, including that by Weissman's and Melton's companies, is focused on developing medical products in the near term from stem cells taken from adults, or from fetuses, but not from embryos. In Melton's case, his company, Curis, is trying to use its work on adult stem cells to develop cures for male pattern baldness as well as multiple sclerosis and other medical problems, and is also working with a Canadian company that

has converted skin stem cells into working brain, bone, and cartilage cells.

Weissman's private affiliations also run toward adult stem cells. "I've placed my bets on adult stem-cell research," Weissman said. But he added that the federal government should fund embryo research to help develop knowledge and new therapies for the future, including therapies that help activate stem cells from adults. Transplants of embryo stem cells to treat diseases such as Alzheimer's are far distant, he said, but added: "I believe that human embryonic stem-cell [research] is vital to the health of science ... [to] academic medical science, [and] for the developing of the next round of biotech."

Financial interests also lie behind much of the internal politics among scientists, which can result in some promising science being downplayed, say researchers, including Peck and McKay. "Diabetes is one of the most political areas I've ever seen in science ... because there is so much potential financial gain, and almost everyone today in science has some connections to biotech or to pharmaceutical companies," said Peck. For example, Peck was not invited to attend an upcoming October NIH conference on diabetes and stem cells, nor to the June debate on stem cells hosted by the prestigious National Academy of Sciences, despite two relevant reports in the past six years by his research team. He and his team had used stem cells from adult mice to eliminate symptoms of diabetes in mice.

Part of the problem is his Florida location, Peck said. "We're not in the Northeast or West Coast 'in' groups in science," said Peck, who nevertheless is regarded well enough internationally to have been invited to Stockholm this week to chair the diabetes session at the International Congress of Immunology, held every three years. "We do have some very interesting results that would be shocking" to the attendees at the October NIH conference, he said, but he currently intends to publish the results at another forum. To commercialize his diabetes stem-cell technology, Peck's university transferred the patent to his company, Ixion Biotechnology Inc., in Alachua, Fla.

—Generally, researchers see no cure for their potential conflicts of interest—except repeated disclosures and broad dissemination of scientific results. "It is an inherent conflict that the people best able to fund and the people best able to do the research will have relationships," said Benz. "If they didn't, the research won't get done." ■