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When will embryonic stem cell researchers be able to fully tap into federal funding, the financial backbone of the US science community? This is what scientists continue to ask, as well as citizens who remain enthused about cells that show promise in the push to treat and cure debilitating diseases.

It has been seven years since stem cells burst onto the scene, but government restrictions on funding embryonic stem cell research continue to plague scientists like John Gearhart of Johns Hopkins University, one of two researchers credited with discovering the cells.

"It's clear that the limitations in federal policy do not permit funding into the most progressive and promising areas at this point, so we turn to the private side," he says. "But there's a limit to how much you can draw from this.... The issue is 'How do we go forward?'"

The prevalence of assisted reproductive techniques has produced an excess of embryos, which often get discarded. But many opponents of embryonic stem cell research, including President Bush, argue that it's unethical to destroy those embryos to obtain stem cells. Pundits called Bush's 2001 policy decision a "compromise": Federal funding would only be permissible, he said, on the known stem cell lines (then 64) that had already been derived from embryos.

Since then, the list of viable cell lines has dwindled, as have the president's supporters on this issue. Polls indicate that a majority of Americans favor government spending on embryonic stem cell research; an August CNN/USA Today/Gallup poll, for example, put the number at 56 percent. In May the House passed H.R. 810, a bill that would permit funding for the research, but only if the embryos had been left over from fertility treatments at in vitro fertilization clinics and slated for disposal, and if the donors' consent had been granted without financial or other inducements. The 238 who voted for the measure included 50 Republicans.

Two months later, Senate Majority Leader Bill Frist (R–Tennessee) announced his break with Bush's restrictions on embryonic stem cell research. The senator—and potential contender for his party's next presidential nomination—pledged to cast his vote in favor of funding stem cell research, saying "the limitations put in place in 2001 will, over time, slow our ability to bring potential new treatments for certain diseases." Frist had been a "key stumbling block" to ushering the bill through the Senate, according to John Hlinko, founder of StemPAC, an advocacy group for embryonic stem cell research.

Hlinko and other proponents were encouraged by the House bill's passage and Frist's support, but acknowledged that they still have hurdles to overcome. They are hoping the bill passes in the Senate with no amendments that could change the meaning or delay passage. Senator Arlen Specter (R–Pennsylvania), sponsor of S. 471, the Senate companion bill to H.R. 810, vowed that passage of legislation permitting funding for stem cell research would become a "priority" during the next session of Congress.

The president has threatened a veto if the bill passes, however, an option he has not exercised on any bill during his presidency. Getting enough votes to override that veto would be a tough challenge, Hlinko said.

Meanwhile, a handful of states have done their own work to support stem cell scientists. In late 2004, California voters approved a $3 billion investment in stem cell research over 10 years. As of August, New Jersey, Connecticut, and Illinois have also taken steps to fund the research, although 20 states have laws in place that restrict it. Hlinko and Gearhart applaud state actions, but say such efforts cannot replace federal support.

The science continues to advance as politicians debate the issue, particularly in nations like South Korea. When Bush issued his directive four years ago, his supporters were touting stem cells from adults as an alternative to those from embryos, although many scientists contended that the adult cells did not hold as much promise. Since then, scientists have found ways to produce embryonic stem cells without destroying embryos: In August, Harvard researchers said they had converted skin cells into embryonic stem cells; in October, two teams announced their successful attempts to grow the cells (from mice) in a lab.

Despite these recent developments, stem cell scientists say this technology still has a long way to go before it could replace research done with embryos, and passing a funding bill remains just as important as ever. "What we're hearing a lot from scientists is how difficult this [ban] has made their lives," Hlinko said. "The industry of the future that could be built here in America is going to be built overseas."

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