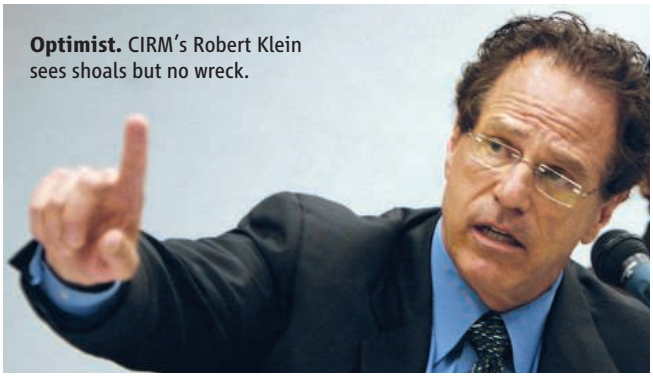
STATE STEM CELL INITIATIVES

CIRM Close-Hauled, Seeks Bonds to Sustain Headway

With dramatic shifts in both the economic and political landscape for stem cell research, the California Institute for Regenerative Medicine (CIRM)—a state initiative set up to avoid restrictions on federal research laid down in 2001 by President George W. Bush—is scaling back, rethinking its priorities, and looking at how to mesh its activities with those that will soon be funded by the National Institutes of Health (NIH). The latter is somewhat tricky, as exactly what types of research NIH will support now that President Barack Obama has rescinded the Bush restrictions with his executive order (*Science*, 20 March, p. 1552)—and how much of the $8.2 billion in NIH's stimulus package will go into stem cell research—remain unclear.

The Center for Genetics and Society, a public interest group in Oakland, California, has hinted that the state may find better ways to spend its money now that the economy is tanking and NIH is no longer inhibited by the Bush policy. But scientists point out that as long as NIH has to comply with the Dickey-Wicker Amendment prohibiting research with human embryos, federally funded researchers will have to look to private or state-supported sources like CIRM for new ES cell lines. They also argue that in California, as elsewhere, a strong local establishment makes scientists more competitive when it comes to getting federal grants.



Optimist. CIRM's Robert Klein sees shoals but no wreck.

Even so, CIRM is simultaneously scrambling to replace a shrinking pot of money from state bond sales and shifting its emphasis from basic research toward bringing stem cell therapies to the clinic. Board chair Robert Klein says he sees the shift as particularly timely to complement NIH's expanded focus on basic stem cell research.

Until recently, things had been looking rosy for CIRM. After being delayed by lawsuits, the agency roared into action in the spring of 2006 with the promise of $3 billion over 10 years from the sale of state bonds ($250 million worth have been sold to date; CIRM got another $250 million as an advance loan on sales). So far, the agency has spent or promised $690 million, according to Vice President for Operations John Robson. That includes $271 million in grants awarded last spring for construction of new facilities at universities, $95 million for grants to train undergraduates, grad students, and postdocs, and close to $115 million in salaries and research awards for new faculty members. One hundred twenty million dollars has been committed to basic research.

Now, says Robson, CIRM has a cash-flow problem. State bond sales have been frozen, and CIRM "would still need another $112 million" to fulfill existing obligations up to the end of 2010. Before the crash, CIRM had anticipated committing $375 million between now and December 2010, says Robson; now, with some belt-tightening, $220 million seems more realistic. At its 12 March board meeting,

Most State Stem Cell Efforts Staying Afloat

In addition to California, several states have made serious attempts to encourage stem cell research. Although some are tightening their belts, these programs generally seem to be holding their own in this uncertain environment—at least for now.

An exception is **New Jersey**. In 2005, it became the first state to finance stem cell research, with a $10-million-a-year grants program. But the state's ambitions have hit some serious snags.

In November 2007, voters delivered a surprise rejection of a $450 million bond referendum to finance research and lab construction. Now, construction of a $150 million research facility for the Stem Cell Institute of New Jersey—for which ground was broken a month before the referendum—has had its budget cut and is on hold indefinitely. Then last month, Governor Jon Corzine zeroed out the annual $10 million for the grant program. Martin Grumet, director of the Rutgers Stem Cell Research Center, says there's still some hope: The governor plans to propose restoring grant money in his next budget.

In **Connecticut**, legislators voted in 2005 to invest $100 million in stem cell research over 10 years, starting in fiscal year 2007. So far, the state has given out $30 million in grants and shows no sign of stopping, says David Goldhamer, associate director of the University of Connecticut Stem Cell Institute. The current assumption is that a full $10 million will be available for the next grant cycle, to be announced at the end of March.

Maryland is committed to becoming "the biotech state," say Karen Rothenberg, dean of the University of Maryland law school, so the state is unlikely to back off its stem cell commitments. The Maryland Stem Cell Research Commission, set up in 2006, has overseen the funding of $36 million in grants so far. But overall funding may drop for a few years: Governor Martin O'Malley has proposed $18 million for stem cell research this year—compared with $23 million last year.

Massachusetts Governor Deval Patrick signed the Massachusetts Life Sciences Initiative last spring, which directs $1 billion in state funds toward biotechnology, including stem cell research, over a decade. Total investments to date amount to $33 million; $11 million of that has been stem cell–related, primarily to support a stem cell registry and bank at the University of Massachusetts Medical School. With the state facing a budget shortfall of $1.4 billion, the Life Sciences Initiative is slated to get a maximum of $20 million instead of the planned $25 million in fiscal 2010.

New York appears to be doing well despite the dour budget climate. Two years ago, the legislature created the Empire State Stem Cell Trust to dispense some $600 million to stem cell research over 10 years. The first grants, $14.4 million for research and training at 25 institutions, were awarded in January 2008. Governor David Paterson has proposed that New York State Stem Cell Science, the granting body, give out $50 million as planned in the next fiscal year. Scientists

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CIRM decided to pull back on some plans—most notably, $40.6 million slated for training grants for undergraduates and graduate students will now shrink to $7 million in this period. Agency officials hope to restore that funding when the economy revives.

Until then, Klein has a bold plan to save the day. He recently obtained permission from the state treasurer to sell $400 million in bonds to private investors over the next 12 months. (Although state bonds are moving again, CIRM's would have low priority.) The perennially optimistic Klein thinks he'll find plenty of takers. "We're structuring it not as a donation but [as] an investment," and the guaranteed 5% interest rate should attract groups that fund biomedical research, he says. Robson adds that other CIRM officials "are not as optimistic as Bob" about finding buyers, but they should be able to carry through their modified plans if sales bring in at least $200 million. Even then, he says, grants for basic research will have to be reduced, from $60 million to $20 million, until at least the end of 2010.

CIRM's shift in focus from basic to translational research began last year, when Alan Trounson took the helm, and is now accelerating. The agency plans to throw major resources into the "valley of death"—the limbo in which promising research often languishes because of a lack of resources to bring it to the point at which it can be tested in clinical trials. A $210 million, 4-year program of "disease team grants," to be awarded this year, is the centerpiece of this thrust. The program will entail perhaps 10 large grants to teams combining academic and industrial researchers working on a specific stem cell product for, say, Parkinson's disease. The goal is to speed work to the point at which the team can apply to the U.S. Food and Drug Administration for a New Drug Application within 4 years. Under this program, biotech companies will receive loans, not grants, to ensure that companies will retain intellectual property. Klein wants to get those loans guaranteed by the federal government under the stimulus package.

Some scientists worry that the emphasis on applications is coming too soon. "I am concerned that some of this rush to the clinic is premature," says Arnold Kriegstein of the University of California, San Francisco. "My concern is … they're taking risks with potentially very little gain."

Officials appear confident that they can hang on until the economy picks up. "I don't think state initiatives will wither" despite the economy, says James Kovach, head of the Buck Institute for Age Research in Novato, California, where construction of a new building has been delayed. He predicts the new presidential stem cell policy will have a "big effect" on the morale of scientists, especially young ones just choosing their careers, who will no longer have to wonder if it's safe to invest their futures in stem cell research. **–CONSTANCE HOLDEN**

in New York have also gotten a boost from the privately supported New York Stem Cell Foundation, which supports a lab on the campus of Columbia University.

Wisconsin, where it all began with James Thomson's successful cultivation of human ES cells, is aiming to have a major presence in the stem cell world, but not through direct state funding of research. Last year, ground was broken for the Wisconsin Institutes for Discovery, part of a $750 million multiyear strategy spearheaded by Governor Jim Doyle to make the state a leader in biotech and health sciences. But the state's direct involvement in stem cell research has been limited to $10.4 million in grants and loans to stem cell companies.

Former **Illinois** governor Rod Blagojevich signed an executive order in 2005 to create the Illinois Regenerative Medicine Institute. John Kessler, director of Northwestern University's Feinberg Clinical Neuroscience Research Institute, says the state gave out more than $10 million in grants in the subsequent 2 years, but the legislature never followed up with more money. Now, he suspects, "the time has passed."

–CONSTANCE HOLDEN

Dream house. Construction on some facilities is delayed, including a global stem cell research center at the Buck Institute in California.

CREDIT: CALIFORNIA INSTITUTE FOR REGENERATIVE MEDICINE

ScienceInsider

From the *Science* Policy Blog

Scientists around the world have been struggling to help a virologist who might have been **exposed to the Ebola virus**. An unnamed scientist at the Bernard Nocht Institute for Tropical Medicine in Hamburg, Germany, pricked her finger with a syringe during an experiment earlier this month. A team of world experts on the deadly disease eventually chose a new type of experimental vaccine developed in a Canadian lab and previously tested on monkeys. In 2003, researchers showed that a single shot of the virus offers protection in monkeys even if administered after exposure to Ebola. As of press time, it was still unknown whether the researcher had been infected.

The mad scramble for **millions of dollars in stimulus funds** has strained the Web site that handles federal grants, Grants.gov. According to data released in March, the site is designed to accommodate 2000 users at a time but was getting requests for 50% more than that. As a result, on 16 March, the system was down for 8 hours.

Dutch science minister Ronald Plasterk announced this week that the **170-year-old severed head of King Badu Bonsu II of Ghana** will be returned to the king's homeland after a writer found it preserved in formaldehyde in a medical research collection at Leiden University Medical Center last year.

The organizer of the **Copenhagen Climate Congress**, held earlier this month, debates with Stanford University ecologist Chris Field whether the event exaggerated the scientific consensus.

Finally, a public contest to name a new observatory module to be connected this year to the **international space station** has gone awry after Comedy Central's **Stephen Colbert** asked followers to add his name to the write-in ballots. His name came out on top, ahead of four suggested names.

For the full postings and more, go to **blogs.sciencemag.org/scienceinsider**.

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