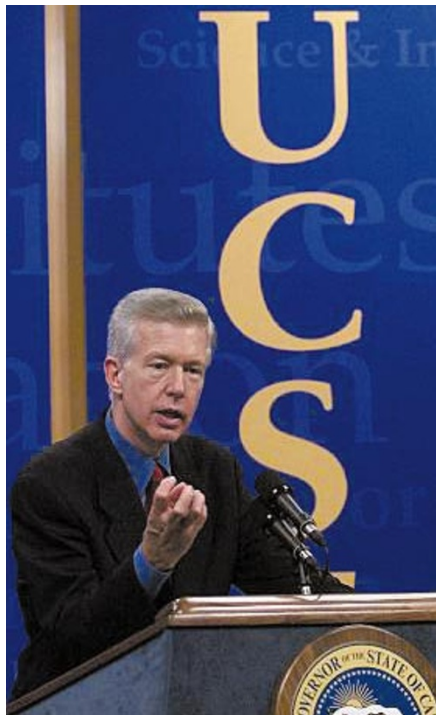


# California invests \$300 million in high tech

Rex Dalton, San Diego

California is pumping \$300 million into three new centres for biomedicine, nanotechnology and telecommunications at the University of California (UC). The centres,



Forward thinking: state governor Gray Davis reveals plans for California to 'invent the future'.

which will be based in San Francisco, Los Angeles and San Diego, will each involve several UC campuses, corporations and investors in an ambitious plan to create new technologies.

A number of state governments, including California, give limited funds to research, but the great bulk of US research funding comes from the federal government. This year, for example, California will receive an estimated \$14 billion in such funding.

But the size of the state initiative — made possible by California's booming economy and budget surplus — may open a new era of major scientific investment by states.

Calling the project "the most ambitious scientific research initiative ever undertaken" by the state, Gray Davis, California's Democrat governor, says the hope is to create "three world-class research and innovation centres with a single mission: invent the future".

The centres and collaborators are: the California Institute for Bioengineering, Biotechnology and Quantitative Biomedicine at UC San Francisco, with UC Berkeley and UC Santa Cruz; the California Nano-Systems Institute at UC Los Angeles, with UC Santa Barbara; and the California Institute for Telecommunications and Information Technology at UC San Diego, with UC Irvine. Each will include new buildings to house laboratories, academics and students.

The centres were recommended by a five-member panel of scientific authorities,

chaired by Richard Lerner, president of the Scripps Research Institute in La Jolla, California. The state rejected three other proposals, but one of these — a centre for information technology at UC Berkeley, to work with three other campuses — was sufficiently strong that UC Davis will seek funding for it in the state legislature's upcoming budget.

A UC Irvine proposal for a centre for systems biology, and a centre for agricultural genomics involving UC Davis and UC Riverside, were not funded. Proponents of the agricultural genomics project were disappointed, but said that promises of industry funding mean that they aim to go ahead with the centre in a modified form.

Under the state's plan, each of the three designated centres will receive \$100 million of taxpayers' money over the next four years. Each centre must also raise twice this from other sources, making the total potential investment worth \$900 million.

Although there are many joint research projects between UC researchers and industry, the explicit mission of these centres to work towards applied technologies has raised some questions about their academic independence.

"It is a challenge to sort how we will do this and preserve the mission of the university," says Zach Hall, vice-chancellor for research at UC San Francisco. "But we are taking on that challenge and want to make it work."

## Pesticides implicated in declining frog numbers

Jessa Netting, Washington

Drifting agricultural pesticides may be eroding once-healthy frog populations in the pristine mountain areas of California, US government scientists say.

Researchers from the US Geological Survey (USGS) and the US Department of Agriculture have found that pesticides used by Californian farmers can disrupt an enzyme that regulates the nervous system of frogs in the Sierra Nevada mountains, downwind of farming regions. These same areas are those hardest hit by amphibian losses.

But this is not the whole story of global amphibian decline, according to researchers who met last week in Washington to discuss the issue. The meeting was organized by the biological division of the USGS.

"I think that one thing everyone can agree on is that there is no single cause. There are many interactions," says Harvard University biologist James Hanken.

Amphibians, with their moist, sensitive skins, unprotected eggs and semi-aquatic lifestyle, have long been viewed as biological

indicators of environmental health.

Biologists became aware of a problem in the 1980s, after reports began to accumulate of dwindling or lost frog populations and unusual deformities in amphibians. Evidence came to light that ultraviolet-B radiation, an iridovirus, a chytrid fungus and fluke parasites could each damage amphibian populations. And a study released last April showed that one frog species disappeared when lakes in the California Sierras were stocked with non-native trout.

Another study showed that tadpoles carry much higher loads of parasites in the presence of predatory fish. This indicates that the effects of separate factors can be compounded when they are combined.

Large numbers of frogs with skeletal abnormalities such as missing or extra limbs have also been seen in some populations over the past ten years. Researchers first blamed the deformities on a pollutant — retinoic acid — but later found that extra limbs could be

The increase in abnormalities may



It's no croak: a combination of environmental factors is behind frog deformities and deaths.

indicate an environmental imbalance. But Carol Meteyer, a speaker at the meeting and a USGS veterinary pathologist, said that such malformations did not themselves contribute to the decline of the species they affect.

Despite the uncertainty, USGS biologist Gary Fellers is confident that pesticides are damaging the Californian frogs. He predicts that firm evidence confirming his theory will emerge within two or three years.

♦ [http://www.usgs.gov/amphibian\\_images.html](http://www.usgs.gov/amphibian_images.html)

♦ <http://www.frogweb.gov/tadd/publications.html>