

► to the right, mindful that many social conservatives in the United States equate research on human embryos with abortion. In 2009, Obama lifted a ban imposed by former Republican president George W. Bush that limited federal funding for human embryonic stem-cell research to just a handful of existing cell lines. By contrast, Gingrich says he would “oppose at every turn any process of destroying embryos”. That could mean a freeze on the approval of new lines, or possibly an end to federal funding for such work altogether.

Romney’s history on the issue is more complex. As a candidate for governor in 2002, he voiced general support for stem-cell science. But, once in office, he vetoed a 2005 bill that allowed cloning to create human embryonic stem cells for research. Romney was overruled by the state’s legislature, but the following year his administration set down regulations that could have criminalized the work of scientists using human embryonic stem cells. However, no scientists were prosecuted under the regulations, and the bill was amended when the next governor took over.

The positions that Romney and Gingrich now espouse suggest that if either were to be

in the White House with a Congress similar to today’s, US stem-cell policy would take a hard right turn. “It would be very likely that there would be a reduction or elimination of funding for embryonic stem-cell research”, says Alta Charo, a professor of law and bioethics at the University of Wisconsin–Madison.

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Romney’s stance on climate has also shifted. In 2004, he issued a ‘climate protection plan’, with targets for reducing carbon dioxide emissions from the state’s power plants. However, by December 2005 he backed away, on economic grounds, from a regional initiative in which several northeastern states banded together to reduce emissions.

Gingrich’s turn on climate has been even more abrupt. In 2008, he teamed up with Democrat and then House speaker Nancy Pelosi in a television advert promoting political action on climate change. He has since been chastised for

this by conservative commentators. Gingrich now says he regrets the ad and, in recent weeks, has further distanced himself from his proactive former stance. After he was criticized on right-wing talk radio for involving Katharine Hayhoe, a climate scientist at Texas Tech University in Lubbock, in a book project on environment entrepreneurship, Gingrich said he would drop Hayhoe’s chapter from the book. Hayhoe supports the idea that human activity is driving climate change. “Any time a scientist stands up in a public forum and says climate change is real and we need to do something about it, there are immediate repercussions,” Hayhoe says.

Yet whoever becomes the Republican candidate — and whoever ultimately becomes president — these disputes may not mean much for the support of science as a whole. Since the cold war, both Republican and Democratic administrations have a steady record of support for basic science. And with the US electorate focused on the economy and unemployment, it seems likely that if science is discussed at all in this year’s campaign it will be in the context of jobs and competitiveness — issues on which all candidates, no matter what their ideology, see a need for action. ■

GENETICS

French institute prepares for gene-therapy push

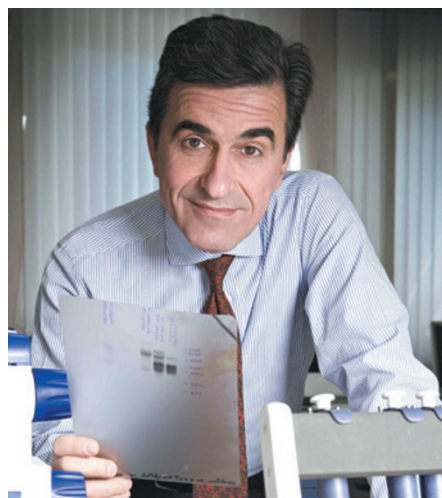
Genethon relaunches itself as a force for translational medicine.

BY ALISON ABBOTT

The French biotechnology institute Genethon is perhaps best known for its unusual funding source — annual television appeals — and for its mapping of the human genome in the early 1990s (I. Chumakov *et al.* *Nature* **359**, 380–387; 1992). Now, after spending years in the scientific doldrums, it plans to become known as the European centre that can speed up the process of getting gene therapy for rare genetic disorders into routine clinical practice.

Scientific director Fulvio Mavilio, a molecular biologist who took office earlier this month, has a mandate to sharpen the research profile of the institute, which employs 180 scientific staff at its base just outside Paris. One of his main strategies is to create international clinical networks for gene therapy around Genethon. The institute should become particularly attractive to international partners later this year, when it opens what will be the world’s biggest plant for

producing large volumes of clinical-grade viral vectors — used to transfer therapeutic genes into the cells of patients.



Fulvio Mavilio is Genethon’s new scientific director.

“Getting vectors is a bottleneck for us,” says Adrian Thrasher, director of the gene-therapy programme at University College London’s Institute of Child Health, and a Genethon collaborator. “Genethon’s new strategy is realistic.”

The first gene-therapy trials involved a handful of children in Italy and France who had rare and fatal immunodeficiency disorders, and showed that healthy genes could be transferred stably into patients to reverse their symptoms.

The early successes spawned a period of hype that came to an abrupt end with the 1999 death of Jesse Gelsinger, a teenager in the United States who had a profound immune reaction to his gene therapy, as well as the emergence of cancers in some immunodeficient children who had been treated. Progress has been slow and cautious ever since. More than a thousand proof-of-principle clinical studies have been done around the world (see ‘Gene promise’), and dozens have shown positive results, but as yet no form of gene ►

► therapy has been approved for routine use by the US Food and Drug Administration or the European Medicines Agency. That situation must change, according to the board of directors of the French Muscular Dystrophy Association, which created Genethon in 1990 and has funded it ever since through its annual telethons.

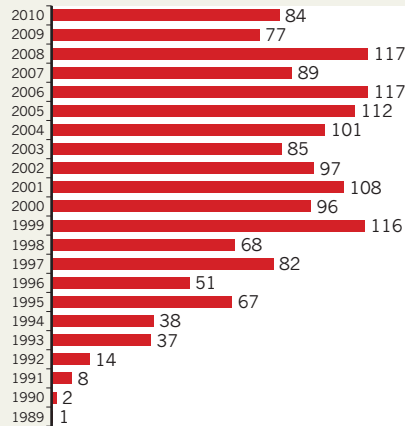
BROAD POTENTIAL

Although the best-known gene-therapy trials have been done in children with immune deficiencies, the technique could tackle a much wider array of diseases. Most of the current clinical studies are in cancer, with researchers trying to introduce genes that will kill the cancer cells directly, or prod the patient's immune system into attacking them. And on 6 January, the American Society of Gene and Cell Therapy sent the director of the US National Institutes of Health a list of the diseases it believes will benefit most in the next six years from investment in translating basic research to the clinic. It included rare immunodeficiency and eye disorders, as well as more common blood disorders, two cancers and Parkinson's disease.

Mavilio worked on the world's first gene-therapy trial, which treated children with the immunodeficiency disorder ADA-SCID at the San Raffaele Scientific Institute in Milan.

GENE PROMISE

Dozens of gene-therapy clinical trials are now approved by regulatory authorities every year.



Another 141 trials have been approved at unspecified times.

Pharmaceutical giant GlaxoSmithKline last year forged a multi-million-euro alliance with the institute to develop similar gene therapy for rare diseases, becoming the first pharmaceutical giant to invest significantly in the field.

“The disadvantage of Genethon compared to the San Raffaele is that it does not have its own hospital,” Mavilio says. “We will be very

proactive in forging collaborations with top clinicians in Europe and beyond so that we can become a major hub for gene-therapy networks.”

The vector-production facility will be a huge asset for this, he says. “But it won't be enough. To get good collaborations, we also have to be known as a force in science.” Genethon moved away from basic research in 2006, to focus on vector production. It now gets more than 90% of its money from the Telethon, but Mavilio wants this to be significantly supplemented by competitive research grants.

Philippe Moullier, director of the French national biomedical research agency's gene-therapy unit in Nantes, and a Genethon adviser, warns that the firm needs “to remain humble and move slowly — I don't know if we can demand to become a European hub”. Thrasher, at least, is enthusiastic about the institute's ambitions, predicting that “Genethon will probably become our first port of call”. ■

CORRECTION

The photo caption in the News story ‘Gemini's twin telescopes reboot’ (*Nature* **481**, 251; 2012) incorrectly identified the Gemini North telescope as Gemini South.