

Geneticists study chimp–human divergence

Erika Check, San Diego

Scientists combing the draft of the chimpanzee genome sequence are finding tantalizing hints about the differences between humans and our closest relatives.

Results gleaned from the publicly available genome, which was released last December, were discussed for the first time at a workshop on 12 March at the University of California, San Diego.

Researchers led by Xose Puento at the University of Oviedo in Spain, for example, are working on genes that encode enzymes called proteases. These genes are almost identical in humans and chimps except for one subset, found in the immune system, that varies greatly between the two species.

This suggests proteases of the immune system diverged rapidly after chimps and humans became separate species. Such findings could help to clarify the differences between the two species. They could also explain why chimps are less severely affected than humans by AIDS or Alzheimer's disease, and might lead to treatments for such conditions.

Evan Eichler, a bioinformaticist at Case Western Reserve University in Cleveland, Ohio, found one section of DNA, 10,000 bases long, that is absent in the human genome but present in multiple copies in the



Relative merits: genome comparison may explain chimp resistance to AIDS.

chimpanzee and other African apes. By sequencing that section, Eichler's lab found that it was similar to a retrovirus that infects African monkeys. Because retroviruses insert themselves into host DNA, Eichler suspects that this virus might have jumped from monkeys into apes.

But experts say that such topics are hard to study, in part because there are still large gaps in the sequenced chimp genome. Reassuringly, Robert Waterston, a geneticist at the University of Washington in Seattle

who leads an international team studying the chimp genome, says that the US National Human Genome Research Institute will provide funding for sequencers to keep plugging the gaps.

Further help in studying chimp and human differences will come from molecular biologist Ajit Varki and computer scientist Chaitan Baru, both at the University of California, San Diego. They plan to collate details of all the characteristics that differ between chimps and humans on a web-based Museum of Comparative Anthropogeny (MOCA). They hope that MOCA will help to reveal how the 1% of the genome that differs between humans and chimps has translated into the huge differences between the two species in areas such as brain size and behaviour.

But biologist Caroline Tutin of the University of Stirling in Scotland warns that, although the differences are illuminating, geneticists should not overlook the similarities between humans and chimps. "Do not forget how similar the chimp and human are, because that is the basis for their conservation," Tutin says. She warns that as wild populations of endangered chimps dwindle, scientists risk losing a species that is not only a precious genetic resource, but a close relative as well. ■

Plague professor gets two years in bioterror case

Erika Check, Washington

Microbiologist Thomas Butler has been sentenced to two years in prison for convictions that stem from a January 2003 bioterrorism scare.

The case began when Butler reported vials of plague bacteria missing from his lab at Texas Tech University in Lubbock. After being questioned by the FBI, Butler said he might have accidentally destroyed the vials.

Investigators charged Butler with 69 crimes related to the incident, including lying to them and defrauding his university. Butler was cleared of the most serious charges last December, but was convicted of fraud against Texas Tech and of mislabelling a plague sample he shipped to Tanzania.

Butler's two-year sentence is more lenient than that sought by federal

prosecutors, who called for millions of dollars in fines and at least ten years in prison. Butler was told to pay more than \$50,000 in fines and restitution. He has already resigned from Texas Tech and paid the university \$250,000. Butler has also been stripped of his Texas medical licence. His lawyers plan to appeal.

Scientists have watched the Butler case unfold with dismay. Many believe that the federal government was harsh on Butler to create a public image that it is tough against terrorists. "Butler is going to federal prison, Texas Tech's reputation is in tatters, and no bioterrorism was even committed," says Nobel laureate Peter Agre, a former student of Butler's who is now a biochemist at the Johns Hopkins School of Medicine in Baltimore, Maryland.

"Everyone has lost," say Agre.

Some researchers say that by making an example out of a 62-year-old, respected researcher the government has undermined its own cause. "This is guaranteed to have a chilling effect on pathogen research," says Steven Block, a biophysicist at Stanford University in California. He cites examples such as that of Harvard University biochemist John Collier, who has said that he threw out his old stocks of anthrax bacteria for fear of running foul of new bioterrorism regulations.

Other researchers have denied any such problem. They point to the eager competition among many scientists for the billions of dollars in biodefence spending that have been made available to counter the threat of terrorism. ■